

COMPUTERWORLD

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Unbundling 'Confusion' Hitting Smaller Users

By Drake Lundell

NEW YORK IBM's "new world" of unbundled software and services is creating confusion both outside and within IBM. Paul D. Dyer, concluded last week after a seminar on "The True Price of Unbundling" sponsored by his firm, Over Professional Computer Services Inc. From discussions at the meeting it is apparent that many large IBM users have been able to wean themselves from the huge firm, but the status and future ability of the smaller user to get along with IBM support services was seriously left in doubt.

In addition, the confusion

within the company itself will lead to further changes in the IBM corporate structure that will have a lasting effect on all segments of the industry. Dyer predicted.

Large Users Optimistic

Most of the large computer users represented at the seminar were optimistic about their future in the "unbundled world," but they admitted they had the resources and personnel to take advantage of the unbundled prices.

A firm like Raytheon, which spends between \$5 and \$10 million a year with IBM, said that it had been forced to examine the role of IBM training and the

need for systems engineers and support previously received free from the industry giant.

The firm found that a large percentage of the training received from IBM was in the area of "concept courses," which were largely worthless and served primarily as a marketing vehicle for IBM, according to Charles Purrelli, Raytheon director of information processing.

To replace these courses, Raytheon will conduct more in-house training and will rely more on "nuts and bolts" type courses, he said. All education will be streamlined to fit the needs of the Raytheon personnel, he added.

In the area of systems support, Purrelli said that Raytheon investigated the 30 to 25 systems engineers that IBM had supplied before and found that only four were "usable" by Raytheon standards. The number of SEs, he said, has already been cut drastically and would be cut further.

By examining those areas and making cuts in the SE staff, Raytheon will be able to live in the new world. While they will be paying somewhat more for services than the 3:1 equipment price reduction announced by IBM with unbundling, they feel that they will get more for the money.

American Airlines also felt that they would get better use out of in-house people as the result of organizational changes forced on them by the unbundling decisions. Chase Manhattan Bank agreed, indicating that they will be able to cut the amount of outside help drastically because of a review for the previously "free" SEs.

'We Don't Need SEs'

As one of the large users said, "IBM has done us a service, we now know that we don't need SEs, we can handle the whole thing ourselves. Before about a third of the SEs in our shop

(Continued to Page 4)



That's Programmed Learning!

Audio-visual computerized lessons aid the teaching at the E. O. Plauen elementary school in Berlin-Kreuzberg, Germany. "Did Stalin and Hitler bring the world to the verge of collapse?" the loudspeaker asks. The pupils can press either the "Yes" or the "No" button, or none of the two. The computer terminal (upper right) registers every reaction. It also reacts when the majority of the pupils press the "Please ask more slowly" or the "Please ask more quickly" button. And the teacher? He sits in the staff-room, and watches a television screen. The lesson is transmitted to him by a closed-circuit television camera.

New Firm Will Service Mixed Configurations

By a CW Staff Writer

NEW YORK A new nationwide maintenance organization will provide service to users owning their own computers or users with "mixed" computer systems was formed here last week by three former executives of the IBM field engineering division. Comma Corp. will offer reconditioning and reconfiguration services to clients, in addition to straight maintenance.

The firm, which is presently operating from offices in New York City, Dallas, Los Angeles, and Chicago, would not disclose its price structure, but said that maintenance services are available at prices that are "very competitive" with IBM.

The company will open offices in 14 additional cities by the end of the year, George O. Harmon,

president and chief operating officer, told CW.

Since the firm will tailor its services to a customer's requirements, Harmon stressed that it should especially benefit those users with large, mixed computer systems made up of units from different manufacturers.

As maintenance consulting service will be available to coordinate the maintenance of all types of equipment—main frame and peripheral—allowing a user to match his needs with the "best mix" of computer equipment, regardless of the manufacturer, Harmon said.

The firm's reconditioning and reconfiguration operations will be based in New York, Chicago, Los Angeles, and Dallas facilities, and its primarily gear-

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\$20/Month Terminal Accesses Audio-Equipped CPU's

By Frank Plaeta

CW Staff Writer

WHITE PLAINS, N.Y. IBM entered the small acoustically-coupled data terminal field last week with the introduction of

the battery-powered 2721 portable audio terminal.

Housed in an attaché case, the device, with a 60-key alphanumeric keyboard, allows a user to communicate, through an ordinary telephone, with an audio-response equipped computer.

The 2721, which will rent for \$20/month and sell for \$600, is said to enable users to enter alphanumeric information into any S/60, Model 25 and up. In the configuration outlined by IBM, the terminal is used with an IBM 770 audio response unit. The 770 unit, which rents for between \$1,250 and \$2,500 per month, plus \$65 per month for the necessary adapters, can handle up to 64 2721s simultaneously. IBM said it is available with from 32 to 128 words of vocabulary, in increments of 32 words, the 770

with an adapter and a vocabulary of 128 words would rent for \$2,500, IBM said.

The small user who may want to utilize the \$20/month portable terminal while not requiring the capabilities of the 770 system, probably could use an alternative audio response system to reduce costs.

Several independent devices apparently could be used in conjunction with the 2721. According to an executive of a communications firm the 2721 terminal could be used, with a variety of audio-response devices.

He stated that any unit that is capable of handling Touch-Tone input should be adaptable to this unit.

As an alternative to the IBM 770, the Datatonic CS-1400, equipped with a 62-word vocabu-

(Continued to Page 4)



An insurance agent visiting a prospect could telephone the company's home office computer to help prepare an estate plan through the 2721. The agent would key in data such as age, number of dependents, income, present insurance and other factors. The computer could then calculate and return information on the amount and type of protection that would meet the prospect's needs through a audio response.

On the Inside

Dartmouth Names T/S Pioneer as President

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Page 6

'Basic' Author, T/S Pioneer Named Dartmouth Prexy

By Edward J. Bride

CW Staff Writer

HANOVER, N.H. — Dartmouth College has named a founder of its Time-Sharing Service (DTSS) and a co-developer of the language Basic to become the college's new president on March 1.

Dr. John G. Kemeny, a philosopher-mathematician who started his academic career 22 years ago as research assistant to Albert Einstein, will become the institution's thirteenth president, succeeding John Sloan Dickey, who will retire.

Dr. Kemeny and Professor Thomas E. Kurtz combined efforts on the development of Basic and on the design of DTSS. Kurtz is now director of Dartmouth's Kiewit Computation Center.

The Dartmouth board of trustees agreed to let Kemeny continue teaching one or two courses after he assumes his new post.

Kemeny is particularly enthusiastic about a course which he initiated only a month ago. It is an experimental "interdisciplinary" course on how the computer may be used more effectively to solve problems of modern society and improve life in a technological age.

Announces DTSS Expansion

Kemeny told CW that he is

looking forward to the expansion of DTSS, and he announced the imminent expansion of the College's Kiewit Computation Center.

A General Electric grant will enable the center to acquire a second GE 635 CPU, plus adding core to achieve 160K capability. He said the expansion of the center and subsequent acquisition of additional hardware would be complete before the beginning of the next academic year.

The DTSS is presently used by about 35 high schools and colleges in New England. Other school systems have followed its example, one being a system in Oklahoma which uses a GE 335 CPU in Dallas.

Kemeny, who often works to two or three in the morning, has

a terminal in his home and will install one in the president's office. He foresees increased computerization of classroom as well as management techniques.

He is greatly responsible for the attainment of "hands-on" computer experience by 85% of Dartmouth graduates, and appears hopeful that such experience may lead to new uses for computers.

Basic Around Campus

Of his several achievements, there is little wonder concerning his proudest: the license plate for his car reads BASIC.

Other achievements include authoring or contributing to 12 books ranging in subject matter from mathematics and computing to the philosophy of science and education. He served as head of Dartmouth's Mathe-

matics Department for 12 years, before establishment of the college's computer center.

At age 18, he worked on the Manhattan Project at Los Alamos; he subsequently graduated first in his class from Princeton in 1947.

He is vice-chairman of the National Science Foundation's Advisory Committee on Computing.

Computer experts commenting on the appointment said that Kemeny is probably the most eminent computer-oriented professor to head an institution of higher learning.

He will be the third nonlumnus and first Princeton graduate to become Dartmouth president.

A native of Hungary, Kemeny came to America with his parents in 1940, at the age of 14.

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System/3 Installed

The first IBM System/3 to be delivered to a customer is installed at Lasko Metal Products, Inc., West Chester, Pa. The unit is the first for Lasko, a manufacturer of appliances and metal products for commercial and government use. Lasko's System/3 will process accounting jobs for plants here and in Franklin, Tenn.

New Firm Will Service Mixed Configurations

(Continued from Page 1)
ed to serve computer leasing companies when a computer system has to be reconfigured from one lease to the next, Arthur H. Bickhoff, Comma Executive vice-president, said.

Market Outlined

Richard K. Puder, Comma chairman and chief executive officer, estimated the maintenance market at \$100 million annually at present and predicted a "substantial increase" over the next few years.

The reconfiguration market will reach \$60 million by the end of 1971, he said, adding that the \$2.5 billion worth of computer equipment now owned by the leasing companies will be reconfigured at least 1.5 times on the average between now and 1975.

To meet this market, the firm plans to hire at least 200 field engineers by the end of the year, and expects to have over 3,000 employees by the end of 1975, according to Harmon.

Maintenance Gap Cited

Many industry observers have noted a "maintenance gap" developing since IBM first began unbundling computer systems

and services. There was already a great deal of competition in the software and education fields to compete with the unbundled IBM, but there were very few maintenance companies, besides those run by such firms as GE and RCA.

While the main emphasis of the firm will be on straight hardware maintenance service, Harmon said that all of its on-site personnel would be trained to deal with both hardware and software problems.

Some industry sources indicate that many of the Comma field engineers will be drawn from the ranks of former IBM field and systems engineers, although Comma said that it would also try to attract people from such firms as MAI and DPA, which offer peripheral maintenance services.

At present, one industry source told CW, many of the IBM field and system engineers are underutilized and are looking for new jobs. Since the number of firms that have signed the new IBM service contract is estimated at less than half the number expected by IBM, reports are circulating of a possible personnel cut in the IBM field and service division.

(Continued from Page 1)
were just receiving on the job training, and we never even charged IBM for that. Others were only there to sell equipment, especially after IBM began giving them a commission on sales last year. The other third was doing the job for the DP manager in that department, because we didn't need them, even though we might hire the SE to take the manager's place."

Users are going to have to be very selective in their software purchases under the new system, however, and will have to develop new methods of evaluating packages, Lees said. He suggested that the user benchmark all programs he plans to purchase before he makes a decision.

Problems Seen for Smaller User

Since most of the panelists and attendees at the seminar represented large computer installations, the small user's problems were largely ignored even though most panelists agreed that the small user has "real problems" in the new unbundled world.

Or as one panelist put it, "Unbundling will be unbelievably unbearable to the unbusinesslike." The small user does not have the in-house resources to fall back on like the large user does, they agreed. He will either be forced to rely on IBM for support or turn to new services for the support previously supplied free.

One industry observer, Frederick G. Withington of Arthur D. Little, Inc., predicted that "most suppliers will unbundle their packaged offering still further, because of the decreasing economic contribution of hardware, IBM's example, and litigation."

This will force the user to "deal with multiple suppliers in order to obtain the best system for his needs," he said. For the large scale user, who can supply systems services in house, and the medium scale user, who can afford to contract out for such services, this need not be a problem, he indicated.

But the small user "will probably be unable to afford the time, thought, and cost involved in using [internal or external] systems architects. As the industry's ability to provide packages of software and hardware tailored for applications or specific classes of users increases it seems likely that the small user will be forced to perform the necessary adaptation to use them."

Facilities Management Seen

Victor Erskine, who is a second vice-president and manager of the systems programming department at Chase Manhattan Bank, predicted that many small companies with computer installations will turn to firms offering facility management services as the problem of unbundling became apparent.

By doing this, he said, the small user would be able to deal himself of the problems caused by unbundling. In the long run, he suggested, this might be less expensive for a small firm, than trying to build up an in-house capability or turning to outside consultants in each segment of the unbundled world.

The user is not the only one confused by the present unbundled world. "IBM itself is somewhat confused," according to Oyer.

"There are," he said, "thousands of systems engineers sitting on their hands in IBM branch offices with nothing to do—because users are not ready or budgeted to pay for their high-priced services [free before Jan. 1, 1970]."

Code Decoded

For those readers who are still trying to find out on which pages we continued the articles in CW's 1970 Software Supplement, CW offers this handy-dandy "Continued on Page" decoding rule.

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\$20/Month IBM Terminal

(Continued from Page 1)
ulary, and 2 lines, would rent for about \$900 per month. This price includes a minicomputer so that the audio response system could also be used offline. The Datatrol unit is compatible with the S/140, according to the manufacturer, and would represent a considerable savings to the user.

The 2721 terminal has 60 keys, 26 letters, 10 numerals and 24 special characters and controls. IBM says that these can be adapted for specific applications with the use of plastic keyboard overlays.

To prevent unauthorized access to data stored in a computer, each 2721 can be assigned an identification code. The computer uses this code to deter-

mine whether a terminal is authorized to obtain or transmit data.

Safeguards can also be written into computer programs to control the data accepted, as well as the responses generated, according to IBM.

The 2721 operates continuously for up to eight hours on rechargeable batteries, or can be plugged into any 110-volt AC line.

The terminal measures 16 by 9 by 4 in. and weighs less than 10 lb. The carrying case provides storage for the power cord, auxiliary earphone, extra keyboard overlays, and the acoustic coupler.

First customer deliveries are scheduled for the third quarter of 1970, IBM said.



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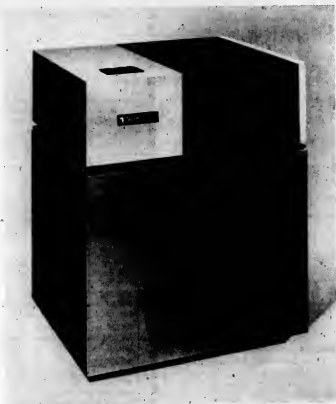
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Cities and Software Firms Will Pick Up Hud's Tab

By a CW Staff Writer
WASHINGTON, D.C. — Software companies are being called on to subsidize the government's development of an urban information system.

The U.S. Department of Housing and Urban Development (Hud) is now negotiating roughly \$8 million in contracts with six cities for the development of such a system. But Hud's \$8 million is only 55% of the estimated cost, and the cities and associated software firms will have to put up the rest.

The project is an attempt to develop a prototype computer-based municipal information system that can be used in any medium size city with population between 50,000 and 500,000.

According to Hud, the projects will take about three years, and have the "primary objective of improving the information and decision-making capabilities of municipalities. The projects also will encourage

the standardization of data and data inventories at the local level as well as through successive levels of government."

Software Non-Proprietary

All software developed under the project will be non-proprietary and "will be designed, developed, implemented, and documented in a way that will maximize the potential for transfer to other municipalities, and thus decrease expensive research by these other municipalities," according to Hud.

Each of the six projects will be a joint effort by a city in combination with a systems company and a university research center.

The six projects include two total integrated systems, and one sub-system in each of four areas: human resource development, physical and economic development, public finance, and public safety [CW, Sept. 3, 1969].

Exact cost figures are still being negotiated,

but Hud estimates that the U.S. government will pay about \$3 million for each of the total systems, and about \$500,000 for each of the subsystems. This represents about 55% of the cost of the project, according to a Hud spokesman.

The other 45% will be made up from state and local contributions, as well as from contributions from the systems companies.

Contribution Encouraged

According to Nathan Blacker, chief of Hud's Contract Branch, the cities and systems firms were not required to contribute. But "it was encouraged that they contribute if they so desire," he said, and "all are contributing some degree of effort."

Roderick O. Symmes of Hud's Data Systems Development Staff agreed that the computer systems companies would be contributing to the project. For exam-

ple, some "software companies are providing people without charge," he said. Carl Davis, project administrator of the University of California's Municipal Systems Research Project, agreed that the projects "cannot be done for the money they are putting up." His estimate is that the total systems will cost \$5 to \$7 million each.

But he supported Hud, saying that only completeness and technical competence, and not money, were considered by the Hud people reviewing the proposals.

According to Davis, the systems will have "considerable transferability" and within a few years a city could implement such a system for one-fourth of what it is costing to develop now. Davis said that he will be conducting seminars on "Automation in Local Government" for the six winning cities.

About 100 proposals were received from 79 cities according to Hud. Proposals were due Oct. 31.

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Israel Uses Braille Equipment to Train Blind Programmers

JERUSALEM, Israel — Braille equipment that will enable the blind to work as computer programmers is being developed by the Rehabilitation Service of the Ministry of Social Welfare here.

Under the guidance of the director, Yehuda Schiff, testing is presently taking place on an instrument designed by the Rehabilitation Service and consisting of three units.

The first of these units is a card reader which gives electric outputs corresponding to the punched-column-holes. The second unit is an electronic matrix which converts the 12-bit Hollerith code to 64 unique signals, one for each character. The character signal is further processed by the third unit which converts the signal to the standard braille code. Electro-mechanical plungers then emboss the braille onto a paper tape output.

The third unit is available in combination with an ordinary typewriter adapted to produce electric signals corresponding to the typed characters. The braille embosser processes the typewriter signals to emboss, simultaneously with the typed character, a braille cell.

When the card reader is connected to the embosser, it produces a braille transcript of the IBM punched cards. In this manner the programmer can get the output on punched cards and then, offline, read and debug his programs.

The three units cost about \$800 to \$1,000, and are purchased for each blind person by the service when he is placed as a programmer, according to Schiff.

More than 30 blind programmers are now employed in industry, banks, and business in Jerusalem, and the number is expected to increase, Schiff stated.

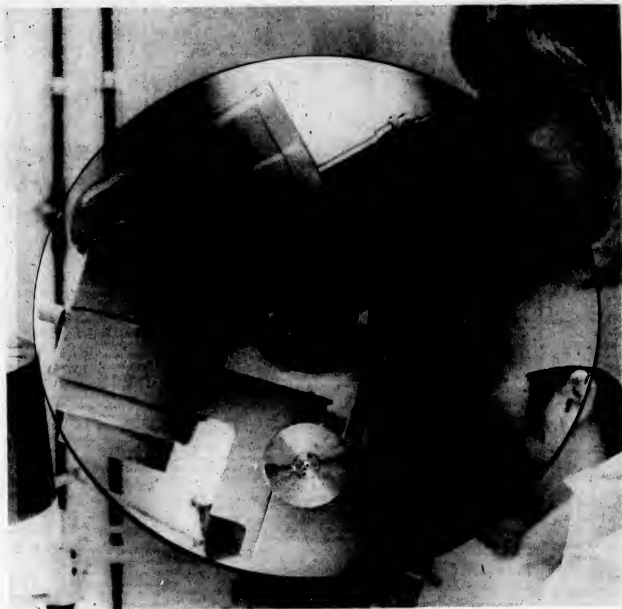
Computers Get Colds

WATSONVILLE, Calif. — Charles Ford Co.'s IBM 360/20 caught a cold.

The company put an 8-ft by 8-ft window in the computer room, and when the night weather turned cold, the computer refused to run the next morning.

The cure was as unusual as the diagnosis. The operators began putting an electric blanket on the processor before they went home at night, and the system began without a hitch each morning.

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Editorials

Is Privacy Necessary?

Some people are beginning to argue that privacy is not only no longer possible but unnecessary. They say that if everyone knows everything about everyone else, then all information becomes valueless.

The argument might have some merit if people were entirely rational. But they are not. All people are emotional to some extent.

Test yourself. A man applies for a job. He has all the experience required and makes a very favorable impression during the interview.

Then the dossier arrives from Personnel Data Bank Inc. It notes the man's father was convicted of murder (but does not mention he was later found to have been the wrong man), that his mother was on welfare (but does not mention that this was made necessary by the wrongful conviction of her husband and the fact that she had five children to support), and so on.

Would you hire this man? If you say yes, there is a serious question whether you are reacting to a theoretical situation differently than you would to an actual one.

Give it some thought before saying that privacy isn't necessary.

1984 Comes Closer

The student pushes a button indicating that Stalin was a villain (see photo on page 1) — and quite possibly this answer will be held against him 20 years from now.

There's nothing evil about the computers and their almost limitless ability to store and retrieve information. But the fact that the computer is blameless should not be construed to mean that it therefore does not need to be controlled.



'My Grandfather Says They Once Had Live Fights'

Letters to the Editor

Criminal Offender Data File Not Being Misused

It is not my wish to antagonize the proponents of security and privacy of information in data banks. This is especially true of a man of Professor Arthur Miller's stature.

It seems to me that so many people that rightly fear the misuse of data bank information by government agencies have a strong enough case without exaggeration of the facts. To malign the NCIC by saying desk sergeants play "dial a name" to see if their neighbors have rap sheets is to reveal lack of knowledge about the system. I don't know of any police agency today that has any idle time to "dial a name" but if this happened to be the case, all they could receive in response to their query is data stating there is or is not a warrant of arrest outstanding for their neighbor.

Professor Miller might have personal knowledge about someone that has an FBI "rap sheet" containing incomplete data about his arrest for being a conscientious objector.

I have personally examined many hundreds of criminal offender files during the past sixteen years. These examinations have revealed occasions where some agency made an incomplete statement in the offense field of the record. However, that particular offense is usually filed by an agent of the U.S. and these agencies are quite proper in their procedures.

The last time I discussed the matter with an FBI agent, I was told they do not create "rap sheets" until after they have knowledge of second offenses.

Every effort is made to constantly update the files with accurate and complete disposition data. The Criminal Justice Community must have accurate and timely data to base proper court decisions upon. No responsible individual is going to misuse criminal offender file data. If he does, there are adequate sanctions, both civil and criminal, that can be sought by either the aggrieved party or other members of the judicial system.

C.J. Beddome, Captain

Arizona Dept. of Public Safety

Not All EDP Equipment Is Manufactured by IBM

I am writing to you concerning your Dec. 17 issue, specifically the article entitled, "Florida Parking Violators Face Arrest."

While I enjoyed reading about this interesting application, I was somewhat disturbed by your

description of the input media. The data processing industry is, as in any other industry, dominated by one manufacturer. It is, however, the trend in today's marketplace to try to counteract the effect of so many years of this domination. This is being done in the best interest of the user public and the free enterprise system. I, therefore, feel that an effort should be exerted by the industry communications media, like yourself, to enlighten the user public that all EDP equipment is not an IBM machine, all card input not an IBM card, etc. I do not think you exercised such an effort in this article where the input to the RCA computer was an "IBM card."

S.B. Scheingarten
System Consultant

Univac
Philadelphia, Pa.

Completely Open Data Banks Give Undue Power to No One

I am writing in response to the letter by Mr. Moran, published in your January 14 issue, in which he suggests that the solution to the privacy vs. data banks problem might be to make the inevitable national data bank completely open.

I think this is an excellent idea (I have thought so for some time — I wish I had said it first).

Bacon said that knowledge is power — and we fear that the data banks could place a great deal of power in the wrong hands — but it is exclusive knowledge which brings power. An open system, with free access to the data by everyone, and with a guarantee that an individual could challenge (and have corrected) erroneous data in his personal file, would give no undue amount of power to anyone, and it would have all the advantages (efficiency, economy, availability of information, etc.) that any other data bank would have.

I think this idea is worth a lot of discussion and thought by all of us. I was delighted to see it expressed in print. Mr. Moran, I hope you have started something!

Thomas A. Casey, Jr.
Instrumentation Laboratory

MIT
Cambridge, Mass.

Computerworld welcomes comments from its readers. Preference will be given to letters of 250 words or less. Computerworld reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 797 Washington Street, Newton, Mass. 02160.

West Coast View

'Sophisticated' Users Mixing Manufacturers

The West heads into the '70s with an air of excitement and enthusiasm that can be summed up with one five-letter word, M-O-N-E-Y.

Companies are proliferating throughout the West in a handsome, clean buildings that give the impersonal, modular look of something put together by children's building blocks. The problem for some companies is getting additional space fast enough as production lines pile up instant backlogs.

The types of products and range of services run the gamut from just "more performance at

less cost" to "the first, the new, and the greatest."

It all adds up to one thing,

Huggins' View
by
Phyllis Huggins

happiness for the user.

Never has he had such a richness of products and services to

elaborate on. The community has matured to where the entrepreneurs now know how to target their products, how to engineer them, produce them, support them, and sell them.

The time was right for the industry to explode in the manner it has. A necessary counterpart of this is the developed sophistication of the users. Entrepreneurs can't walk alone.

It used to be that anyone with a non-IBM system was more to be pitied than scorned. Now just the opposite is true. The sophisticated user uses a mix of manufacturers in his system design as

a sign of his sophistication.

This same attitude is now moving into the software segment as unbundling opens the door to a look see at what the independent houses offer. This development is moving with more caution than the hardware side of the house but the momentum is beginning to take hold.

The emancipation of the user is a sign of the times.

There are two notes of apprehension out here. One is the tightening of money. Cash flow, available financial backing, transactions of cash—these are critical for companies developing data processing departments. So far, there is still capital around, but there is concern as to the extent of the current tightening situation.

It would be devastating if at this blossoming point in the industry's development, a cash unavailability would blight the growth.

The other apprehension is the cutback in military spending. This is something that everyone wants, but what are the side effects going to be?

It is critical here in the West, as for example, an estimated one out of two manufacturing workers in southern California is employed by the Department of Defense. Boeing has announced cutbacks of 18,000 M.Donnel Douglas and North American have announced cutbacks of 25,000.

The recently announced Department of Defense cutbacks of \$1 million plus can't help but hit the West.

This results in a consolidation of data processing centers, already underway, and a reduced demand for the support of outside service bureaus. Any tremor in the Department of Defense spending affects the west and the current cutbacks can by no means be called just "irreversible."

Looking and Leaping

User Can Now Learn by Looking Back

"Look before you leap" is an old adage. It is also a very sensible one, too sensible times. The question is what are sensible times? A sensible time is one which literally can be sensed where the facts and to some extent their results can be seen, measured, and appreciated. This

Taylor Report
by
Alan Taylor

is directly implied in the saying because looking is no good if you are in an impenetrable fog. In that case the ordinary human being, not being equipped with radar, does no good by looking at there is nothing to be seen.

Factually, computers have been in such an impenetrable fog throughout the 1960s. True, we could see that potentially the economic result of doing a payroll on a computer was at least marginally worthwhile—and in addition we could list a number of potential intangible benefits such as "centralization," "management efficiency," "fast response," etc. These benefits could and did justify obtaining a computer. A computer can be, and often has been, justified without the consequences of the action being understood. The impenetrable fog was still there.

On the whole, and in spite of the prophecies and reports which came out of many computer consultants, industry was correct in its decision to just go ahead and buy. The fact that decisions to do this were made on the golf course rather than in the technical support rooms is irrelevant. It was justified by being able to say that this was the only way that their firm could find the experience that was going to be needed in the future.

Are Computers Special?

Does this mean then, that computers and computer procurement are exempted from the

adage "look before you leap"? Does this mean that, where there is a fog, looking is not necessary?

Not really. What it does mean is that where a procurement has been made without looking, NO MATTER HOW JUSTIFIED IT IS, A FOG OF UNCERTAINTY WAS there is a contingent requirement to start looking, backwards if necessary, right as soon as the fog shows any sign of clearing. That is to say LOOK AFTER LEAPING, if you didn't look thoroughly before.

Now it is very nice to say that looking after leaping is a necessary item. There are lots of such "necessary" items. Looking is not something that can be done perfunctorily, by reading columns such as this, or literally, exhaustively, a question researched to death by committees and more committees. Neither of these extremes is really worthwhile.

From a management point of view, what is worthwhile is ensuring that the company does at least know how to look. Factually there are now twice as many ways of looking at a computer installation as there were even a year ago—never mind three or four years ago. The IBM System Measurement Instrument Service (SMIS), for instance, was introduced late in 1969, and an IBMer said recently, "A number of people will be surprised by what it tells them." So, the fog is clearing. Looking both before and after leaping is beginning to be practical at last because we are entering a new era where there is a greater ability to sense our environment. Management will have responsibility to at least know the various ways of looking, so that they, themselves, can decide on just how much resources are

This "Taylor Report" is the first of a series of weekly columns by Alan Taylor, former editor of *Computerworld* and now president of Computer Management Aids Corp.

Taylor, who has been user, writer, and consultant, began his data processing career with De Havilland Propellers Ltd. in 1956. He subsequently worked for Univac, Auerbach Standard EDP Reports, and Honeywell before joining *Computerworld*.

needed to make their installations sensible ones, as the foggy sixties gave way to the sensible seventies.

Next week we will look at some of the ways that are appearing which will help to clear the fog.

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He Appeals to Computers

FRESNO, Calif. The Internal Revenue Service has filed a civil suit demanding the return of \$1,911 from Brent M. Summers, a construction worker who appeals to computers.

The IRS said in 1966 Summers received a refund of \$956 when he was supposed to get \$10, in 1967 he got \$81 instead of only \$86, and in 1968, when he had no refund coming, he received \$551.

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Viatron: Miracle or Mirage? - Part IV

System 21 Can Operate in a Time-Shared Environment

By M.L. Stiefel

Special to Computerworld
The businessman who works with a service bureau can use System 21 in a remote batch configuration if the service bureau can support it. Data can be collected on Viatrate during the day, read over phone lines to any ASCII-compatible receiver at the service bureau at rates up to 1200 Baud, and stored to await processing.

If the service bureau doesn't have a remote batch capability, then Viatron's computer-compatible tape enters the picture, along with a Cobol or Fortran package to translate computer-compatible tape inputs on the service bureau computer. The package can be added to the user's existing applications programs in these languages, to be called as a subroutine whenever reading or writing is to be done with computer-compatible tape.

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The System 21 has sparked a continuing controversy since its announcement. However, little attention has been given to the capabilities of the equipment in relation to the prospective user.

This series of articles discusses the effectiveness of the equipment in specific applications.

Naturally, if Cobol or Fortran is not being used, then the computer-compatible tape cannot be used either.

However, assuming that these requirements are met, the user maintains a Viatrate master file in his office containing information that is being processed. Data is transferred from this file to the computer-compatible tape whenever a transaction occurs. The operator fills in the variable fields, such as amount, due amount, purchased, quantity received, and hours worked, etc.

In this case the System 21 terminal would contain a display, advanced logic, memory, keyboard, a computer-compatible tape channel, and a Viatrate channel, priced at \$111 per month.

For the user who already has his third-generation machine which can talk to other computers through communication lines, additional applications of System 21 are possible. Certainly, remote batch operations can

be performed, as with a service bureau. In addition, a time-sharing system can be built, using the larger computer to communicate with Viatron's own computer (\$99/month for the 4K core version which can interface with eight System 21 terminals; \$199/month for the 8K core version, with 24 terminal capacity) which would be tied to System 21 terminals in various locations.

In this configuration the Viatron computer acts as a switch. It polls the terminals, accepts and buffers messages, sends messages to be processed (one at a time) to the big computer, and routes the response messages back to the terminals.

If the big computer has multiprocessing capability, then the Viatron time-sharing system looks like one customer which is served over a high-speed channel. Naturally, in periods of heavy demand, the response times at the individual terminals will be slow (several minutes in the worst case), but this will still produce an order of magnitude of improvement in response time over any conventional batch processing system.

If a user wants to develop his own programs on Viatron's computer, he will need at least one of the forthcoming "master terminals" which will probably carry a higher price tag than the other versions of System 21.

The Viatron computer will be able to override manual switch settings to control information flow to and from the master terminal. With the standard terminals, on the other hand, the sending or receiving of data on a given I/O or tape channel is entirely under operator control.

No matter which terminal is used, the terminal logic and memory organization effectively limits message lengths to 80 characters, which may not be sufficient for every application.

Also, if the computer sends a message to the terminal, it will overwrite any data keyed in by the operator, unless the 80-character record is split up into a segment for the operator to use and a segment for the computer to use.

If a more powerful time-sharing arrangement is used in which a message entry at one station can result in an output message at another station, then each station must contain essentially two separate System 21 terminals — one for conversation with the computer and one which is dedicated to receiving messages from the computer.

Finally, there is the problem of software procurement. A Viatron spokesman has said that the firm does not intend to write applications programs. However, Viatron Programming Inc. (a subsidiary) will provide software for a price. Or the user can write

his own programs.

Essentially all of these remarks about the third-generation equipment user can be applied to the companies that use outside time-sharing services.

These users can utilize System 21 with a printing robot, IBM Selectric typewriter, and communications channel as an I/O terminal. This configuration can be used for remote batch if the time-sharing service runs in stand-alone batch mode at night. Or users can design their own little time-sharing system which will use one port on an outside time-sharing computer.

Conclusions

From the user without FDP equipment of any kind to the man who has it all, System 21 seems to offer a useful family of data processing tools.

It has a keyboard, display, tape, communications, a computer to interface with. The potential is there, but the questions linger on.

It's relatively inexpensive to rent, but isn't very effective for less than \$75 a month.

Because of the interest generated by the System 21, CW would like to hear from other users who have installed and evaluated the terminal.

M.L. Stiefel is an independent consultant in the area of systems design. He has had extensive computer peripheral experience.

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Ohio Bell 'Isal' Proposal Affects Time-Sharing Users

By Ronald A. Frank
COW Communications Editor

COLUMBUS, Ohio — State tariff hearings—scheduled to begin here soon—could have a profound effect on future time-sharing costs across the country. At issue is part of an overall rate increase proposal, filed by Ohio Bell before the public utilities commission, which would reclassify telephone circuits used by time-sharing customers terminating at a computer, designating these lines as Information Systems Access Lines (Isal).

The reclassification move, together with proposed rate increases as high as 400% for the Isal line, is seen as a precedent-making proposal by industry observers who feel that AT&T with the Bell System has embarked on a concerted drive to isolate and reclassify time-sharing computer subscribers.

In applying for the Isal tariff, Ohio Bell has based its proposed increased rates on the claim that computer time-sharing users typically utilize their telephone lines for longer periods than other business users. In Bell terminology, the longer holding times of the computer-linked time-share users make greater demands on the phone network than other business users. The time-sharing companies emphatically disagree.

Although the Isal rates have been proposed for intrastate lines, the implications are clear enough to have attracted major time-sharing companies and the

Department of Defense.

A DoD spokesman told CW that the government had entered the upcoming hearings in the capacity of a consumer "with a large financial interest," since it has a yearly intrastate telephone bill of more than \$3 million. The Ohio Bell tariff proposal which includes the Isal charges would increase overall rates to telephone customers by more than \$80 million.

The spokesman added that the government is aware that the Isal designation could lead to a potential discriminatory rate situation, levying higher charges to time-share users on an arbitrary basis. In this regard, the DoD, representing all agencies of the government, is evaluating the impacts of the Isal proposal. The Ohio Public Utilities Commission has stated that since the Isal service is a new offering, "a complete explanation" and comparison with existing business line rates should be made by Ohio Bell in order for the commission to determine the reasonableness and justice of the proposed rates and whether or not "an Isal line is properly classified. The increased cost implications of the Isal lines are high. One time-sharing company told CW that a telephone circuit previously costing \$8/mo had been increased to \$24/mo under an interim Isal designation leveled last summer. The ultimate cost according to the user would go to \$37/mo if the Bell rate increases are approved.

Official Ohio Bell documents state that the Isal classification is designed "to more accurately

recognize the increased holding times [of time-sharing customers] that generate a high volume of calls through central office equipment, thus reducing the availability of trunking and switching facilities to the general public."

The time-share companies apparently will contend that their typical holding times are no longer than customers such as telephone answering services and similar, high-volume telephone users. Therefore the Isal rates are discriminatory, they say.

The Ohio hearings may well set the pattern for other Bell companies. If the Isal classification stands, other telephone companies are expected to file similar proposals in other states.

It is known that the Bell Sys-

tem has been intensively investigating the usage characteristics of time-shared facilities being utilized by computer data users. One report issued by AT&T on time-sharing customer lines in the Los Angeles area states that these lines "require four to six times as much equipment and trunking as compared to other IMB [business] lines."

The report adds that "so far the tariff rate is the same. The American Company [AT&T] has proposed a new tariff to compensate for the extra switching equipment that computers require."

The Ohio hearings are scheduled to begin Feb. 10 with DOD, General Electric Co., and ComShare Inc. participating.

Western Union Would Allow User Terminals on TWX Net

WASHINGTON, D.C. — If the proposed sale of the Bell Teletypewriter Exchange Service (TWX) facilities to Western Union is approved by the FCC, the new owner will allow customer-provided teletypewriter terminals to be interconnected. According to a WU spokesman, type-accepted teletypewriters would be permitted on the TWX network if they were connected using Bell-supplied Direct Access Arrangement (DAA) devices.

DAA devices are presently used under existing tariffs to connect user modems directly to the Bell network. Similar devices would probably be provided for TWX interconnection.

The WU move is expected to expedite approval of the TWX network sale. Current FCC hearings are being held to rule on both the TWX sale. The revision of the TWX tariff, although expected, is a separate issue.

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February 4, 1970

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'Deadline' Saves Lockheed-Georgia \$250,000

ATLANTA, Ga. — Lockheed-Georgia is realizing savings of about \$250,000 per year in direct costs using the Deadline installation scheduling system developed by Synergetics Cybernetics Inc., a Lockheed spokesman told CW.

Lockheed has been working with planning and scheduling systems for the past two years, according to James R. White, manager of data processing operations.

Lockheed's center, which houses more than 15 computer systems, has estimated that it will reduce the percentage of late reports from 7% last year to an estimated 3% this year.

After a deadline, developed under a Lockheed contract, has been aimed at large computer installations (it has been sold to six major corporations). White felt that it would work equally well for smaller sites.

At Lockheed, the system is

primarily used to schedule all of the workload for at least seven computers and over 130 people. The personnel include all the manual operations and peripheral functions such as keypunching and card sorting.

White feels that the principal advantage to Deadline is its ability to maintain control over each functional area in data processing. Lockheed works through five functional areas: keypunch, EAM, computer time, peripheral

operations (card-to-tape, etc.), and distribution (bursting and collating).

He pointed out that EAM and keypunching bottlenecks contribute at least as often to late reports as to computer room delays. Deadline's ability to identify such bottlenecks early can save significant work and money, he explained.

Savings Realized

Overtime has been reduced by 36%, in spite of a 15% increase in workload, White said.

Previously, Lockheed was using about 1,100 hours per week of overtime with peaks of 2,000 hours. With Deadline, the firm has been able to cut this figure to an average of 700 hours, saving the company some \$150,000 per year, according to White.

By leveling the shop workload, Lockheed has also achieved a 10% staff reduction, saving the company another \$100,000 for the upcoming year.

Equipment Used

The system has also enabled White to spot under-utilized equipment. This has allowed Lockheed to increase its workload without increasing its equipment.

As an example, White explained how Deadline could re-schedule a job that required a lot of off-peak work to a busy shift to a shift where there was more time available on a printer, thus reducing the need for additional printers.

Intangibles

White feels that the foremost benefit is a nondirect cost area

in the speed-up in report production. The secondary benefit became clear when a CW reporter visited the plant during a major ice storm.

Due to absenteeism, the center was 18 hours behind schedule. Through Deadline rescheduling, White said, the center would be completely back on schedule within 48 hours.

Other indirect benefits that White pointed out came from increased budget controls, and the availability of documentation to justify new equipment. He pointed out that the only criteria his company would now accept for new equipment was the output from Deadline.

The system can also calculate the cost of a given job as a function of the speed with which it must be run and the priority it takes in the shop.

As an example, White pointed out that a report could be requested as urgent for Monday morning. The scheduler might calculate that the additional cost for having the report Monday morning would be \$1,000. The same scheduler would indicate that the job could be completed Tuesday morning without any extra cost.

Thus, a management decision could be made based on accurate cost data.

Requirements

In its current form, the system requires a 256K 360/40. The package is now being rewritten to allow its use on smaller 360s, according to an official spokesman.

Deadline is available for \$14,000. Synergetics Cybernetics has offices at 421 King St., Alexandria, Va.

Axicom Adds On-Line Plotting Service to Time-Sharing Network

NEW YORK — Axicom (formerly Access) Systems Inc. led the service field at the recent Compo show where by the introduction of two time-sharing related services.

A communications network and an on-line plotting service

have been made available by Axicom.

The communications network, which operates at 30 char/sec. in the Teletype environment, provides users with access to Axicom's Univac 1108 at speeds three times faster than previously available. A company spokes-

man said that upgrade in throughput from 10 to 30 char/sec. is available to users at no increase in price. The service is available between Boston and Washington.

The plotting service, dubbed Axi-Plot, uses a Houston Instrument Corp. PTC-4 plotter controller, a Complot DPI (11 inch) or DP-3 (21 inch) plotter also from IHI; a Computer Terminal Corp. Datapoint 3300 visual display or other Teletype-compatible terminal connected via an acoustic coupler.

Using the CRT, the user can edit and execute stored programs and route the output to the plotter at 300 to 700 increments per second, the firm said. The basic remote plotter configuration will be offered at an estimated \$550 per month.

Axicom Systems Inc. is located at 615 Winters Ave., Paramus, N.J.

'Access' Helps Businessmen Converse With Their Files

OKLAHOMA CITY, Okla. — A time-shared information storage and retrieval system, called Access, has a "dial out" feature and a language simple enough for a secretary to understand and maintain data files, according to the developer, Academy Computing Corp.

Access can be used where machinery requiring monitoring is located remotely, according to James Kennedy, general manager of ACC.

Access operates in both a programming language mode, with Dartmouth College's Basic, and a conversational mode, with a version of ACC-developed "verb" permitting full manipulation of any material in the data base. With Basic and the Access verb, the user can develop his own programs.

The deferred run and callback capability of the system allows the user to specify a time at which the program is to be run.

Cosmic Adds 30 Char/Second Printing Speed

NEW YORK — Cosmic Corp. has added eight million characters and high-speed (30 char/sec) printer capabilities to its Cosmic-d time-sharing system, which is based upon the Digital Equipment Corp. PDP 8/i.

These capabilities were added to enhance Cosmic-d's usage in applications that require bulk storage and high-speed printing.

The Cosmic Corp. is located at 132 West 31 St.

day or night, and the computer will call the user's terminal at that time.

The charge is \$10 an hour for ordinary connect time, with a CPU charge. The charge for storage is 50 cents per 1000 characters. The charge includes installation, documentation, training, and support, said Kennedy.

Academy Computing Corp. is located at 5005 N. Lincoln Blvd.

DEC Gives Users Free PDP-9 Statistical Package

MAYNARD, Mass. — A general purpose statistics package, called Statpac, is available at no cost to Digital Equipment Corp. PDP-9 and PDP-11 (Model 20 and larger) users.

Statpac is said to allow the user to perform a variety of descriptive statistical analysis operations on his data. Five Fortran modules — control, input, descriptive statistics, stepwise linear regression, and multiple linear regression — are available.

The control module performs the necessary executive communication functions so that the user can interact with the system with a minimal knowledge of the computer's operation, according to DEC. The input module prepares and converts the input data to the format required for statistical analysis.

The descriptive statistics module provides a means of determining whether a given set of statistical algorithms can be applied to a given set of data. This module can develop statistical results such as mean, standard error of the mean, standard deviation, variances, skewness, kurtosis, maximum/minimum

range, and correlation matrix.

The multiple linear regression module uses an input matrix and supplies the values of the coefficients of an equation used to represent a model. The stepwise linear regression module performs analysis upon multiple

variables, by examining their contribution to the model and including or excluding them based on pre-established significance levels.

Users of the PDP computers with at least 8K of core memory, a high-speed paper tape

reader/punch, and two DEC tape transports can run the individual Statpac modules.

Documentation and support are provided with the package.

DEC is located at 146 Main St., here.

1130 Charts Air Cooling Parameters

SYRACUSE, N.Y. — A computerized service has been made available to aid consulting engineers in selecting components of large air conditioning systems.

A consultant using the Carrier Air Conditioning Co. service contacts a company field office, provides input data, and receives his computer-output answer from the field office within a few hours, according to the company. The field offices access the firm's 1130 computer with communications terminals.

The output data provides details on the exact unit requested and can list alternatives that closely approximate the first choice but are less expensive, according to the company.

For example, a sales engineer

can select a 19C hermetic centrifugal from four choices in less than 10 minutes, according to a company spokesman.

Carrier's 1130 computer lists hundreds of possible combinations in the 350 to 2,000 ton range. Current scheduled time spans between transmission of the problem and receipt of the

answer is about four hours, according to the company.

Computer output also includes specific operating costs for all selections and lists precise unit capacities.

The service is available in the United States and Canada through Carrier Corp. field offices in major cities.

OS/360 Users Can 'Tele-Cobol'

NEW YORK — A package which allows OS/360 users to receive and transmit data to remote terminals using the Cobol language is available from Complex Systems Inc.

Called Tele-Cobol, the package is said to be designed for com-

panies considering switching from installations from Cobol batch jobs to an on-line system.

The system requires a 30K partition under OS/MFT.

Complex Systems Inc. is located at 122 E. 42nd St.

New 'Comput-A-Bill' Service Handles Medical Billing

WESTCHESTER, Ill. — Hospitals and other medical service organizations can now use an integrated medical claims and posting service recently announced by Communication Dynamics Systems Inc.

The Comput-A-Bill system can be used in private practices, group practices, medical clinics, and hospitals, according to the company.

Input to the system comes over telephone lines from Touch-Tone telephones from the doctor's office.

Output includes a monthly statement for each patient based on family rather than individual billing data. Service charges are on a per-bill, rather than a per-transaction basis. The charges include payment entries, automatic aging of receivables, week-

ly reports, and monthly trial balances by patient, according to the firm.

Practice-wide messages, automatic recalls, collection messages, color-keyed overdue account notices, postage-paid computer mailings, and accurate control over accounts receivable are among the features of this service.

Billing and posting operations

that would normally require two hours per day, if done by manual methods, can be done in less than 10 minutes, the firm claims.

A companion system, Comput-A-Claim, handles the problems of medical insurance claims, the company says. This system stores 10,000 medical procedure codes, allowing for its use by all types of specialists.

Twenty or thirty claims per week are said to demand a large amount of a doctor's time, using manual methods. The form generator in this system provides the doctor with a completed claim for Medicare, Medicaid, Blue Shield, or Health Insurance Council (the approved form for all commercial insurance companies).

The doctor simply fills in the

diagnosis and signs the form.

The system is currently being used by the Loyola Medical Practice Plan at the Loyola University Medical Center, as well as several private practitioners, according to the company.

Franchises for running this service, as well as service information, are available through the company's offices here at 10353 W. Roosevelt Road.

'Compas-II' Automates Airline Reservations With CRTs

WALTHAM, Mass. — A system that automatically analyzes flight and seat availability and issues aircraft boarding passes directly to passengers is available from Data Architects Inc. Designated Compas-II, the system transfers stored data

from a central computer-based system via telephone lines to television screens and Teletype consoles operated by ticket agents within air terminals or in remote locations.

The system provides ticket agents with a video display of

flight number, aircraft destination, availability counts, seating class, and section number. Agent requests are sent to the central computer where they are checked for availability. If no conflict arises, the system issues a boarding pass directly to the passenger.

Compas-II can handle up to 10 aircraft and 40 television screens and consoles simultaneously. The system is built around the Digital Equipment Corp.

PDP-8/L, and can be expanded to accommodate additional modular increments of 4K of core memory.

Purchase price of a completely operational basic Compas-II system is \$275,214. This includes hardware programming, documentation, site installation drawings, operation manuals, and system maintenance procedures manuals.

Data Architects Inc. is located at 213 Third Ave.

Chromatograph Package Calculates Fused Peaks

WHITE PLAINS, N.Y. — Up to 30 chromatographs are said to be monitored simultaneously by an IBM 1800 system using a program which will be available from IBM in the fourth quarter of 1970.

Chromatographs are laboratory devices that can automatically detect and measure components of a chemical sample. With the Chromatograph Monitoring Program, up to 60 of the devices may be wired to a single 1800 data acquisition and control system according to IBM.

The system calculates fused peak areas which identify specific components as the samples are broken down in the chromatograph. The program also filters out unnecessary data, adjusts in-

strument settings without interrupting test operations and produces reports detailing the chemical composition of each sample, according to IBM.

The Chromatograph Monitoring Program operates under the IBM 1800 Time-Sharing Executive (TSX) or the Multiprogramming Executive (MPX) operating system. The program will be available under a license agreement at a monthly charge of \$160.

'Plus' Price Up

Cullinane Corp., 60 State St., Boston, has announced that the price of its Program Library Update System (Plus) has been increased from \$1,500 to \$1,900 as of January 1, this year.

New from MetroData Systems, Inc. DL 620A, a complete 18-channel Digital Data Acquisition System for only \$3,900

The compact and lightweight design, plus low power requirements, makes the DL 620A an extremely versatile unit. Ideal for general purpose recording of analog or digital data on magnetic tape both in the laboratory and remote installations.

This unique digital recorder weighs only 18 lbs. and needs minimal power of 35 watts. Features include a prescannable crystal-controlled clock; ability to accept eight analog or direct digital data; high Z differential analog input stage; selectable recording rates; cartridge magnetic tape system supplies. Data recovery options include; tape-to-tape, tape-to-computer, and real-time. Write for complete story on the Model DL 620A and associated equipment.

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Nonimpact 250-Char/Sec Printer Uses Inkjet Assembly

By Christine Magnuson
CW Staff Writer

CHICAGO — A nonimpact inkjet communications printer available from A.B. Dick Co. is meant "to fill the gap between lower speed teletypewriters and higher speed extensive line printers," according to the company.

Called the Videjet 960, the printer is said to be suitable for time sharing and/or telecommunications environments. The Videjet 960 prints at 250 char/sec and is priced at approximately \$7,000.

A company spokesman stated that A.B. Dick "tried to match the approximate maximum data transmission speed that can be achieved over voice-grade lines" with a printer.

The 960 printer provides real-time printout of serial or parallel data input. Information can be derived from data sets, data processing equipment, or other sources compatible with the interface module or modules supplied with the 960 printer.

Designed for unattended, automatic operation, the printer consists of an electronic section and a nonimpact, inkjet printing and paper advance assembly, according to the company.

The Model 960 responds to eight-bit binary data conforming to the ASCII code. Character and control codes are represented by seven-bit words, and the eighth bit is provided to indicate even horizontal parity.

Standard character spacing for the Videjet is 10 char/in., but is adjustable from five to 15 char/in. Maximum print line width is 13.6 inches. Line spacing is six

systems/ peripherals

line/in., with single or double line space controlled by switch setting.

No special paper is required, a company spokesman stated. The device handles standard fan-fold continuous business forms in stock weights from 10 to 125 pounds.

If a user needs copies of printed data, he can use A.B. Dick Videjet ink and continuous form paper masters to prepare direct image offset masters as his hardcopy printout.

The printer is said by the company to be quieter than an elec-

tric typewriter, since during the printing process only ink touches the paper.

Inkjet Printing Process

The inkjet printing process works as follows:

When the inkjet assembly (consisting of a small metal chamber with a minute opening) is energized by a source of ultrasonic energy, the ink is discharged from the opening as a stream of droplets of uniform diameter and at a rate equal to the frequency of the energizing signal. The droplets break away from the main ink stream at a point slightly in front of the opening. A variable video-type electrical signal is impressed on the inkjet assembly, and each droplet accepts an electrical charge equal to the instantaneous value of the

signal at the point of its breakaway. In the video context, the imprinted paper is analogous to a CRT screen.

The controlled droplets are then directed between a pair of fixed deflection plates charged at a set high voltage level. Each character is formed from a field of nine x 11 dot positions.

The characters are formed vertically by the deflection of the jet; the charged droplets are deflected vertically under influence of the electrostatic field as a function of their individual charges. Characters are formed horizontally as a result of the relative movement of the paper and jet assembly. Uncharged droplets are returned to the ink supply.

The Videjet 960 printer is available on a 30- to 90-day



Videjet 960

delivery schedule. The printer is warranted for parts and workmanship for a year. A.B. Dick Co. is located at 3700 W. Touhy Ave.

300 Card-per-Minute Card Readers Priced at \$1,600

NORRISTOWN, Pa. — Two 300 card-per-minute card readers are available from Peripheral Dynamics Inc., a subsidiary of Systems Engineering Laboratories Inc.

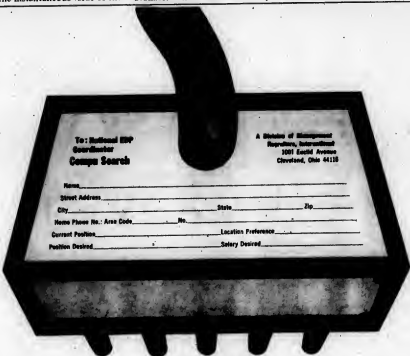
The Model C301 is a table model, and the Model C302 is rack-mounted. Both models can operate with either a general-purpose computer or remote terminal, according to the company.

Priced at approximately \$1,600, the printers feature card feed stop, motor shut down in

case of a card jam, and an attention light that tells the operator when the output hopper is full, the input hopper empty or if there is a no-pick condition, the card not being transferred to the read station.

Three illuminated controls—power on/off, card feed start with operator attention light, card feed halt—are included, according to the company.

Peripheral Dynamics Inc. is located at 1030 W. Germantown Pike.



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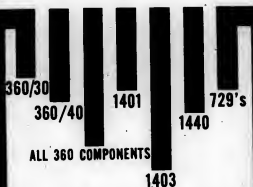
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Two On-Line Devices Introduced by ITT

By Drake Lundell

CW New York Bureau

NEW YORK — International Telephone and Telegraph Corp. (ITT), through its new Data Equipment and Systems Division, was the only major firm to introduce new peripheral equipment at the recent Compo show here. Most of the ITT equipment has been in use in Europe before the introduction into the U.S. market, CW was told.

ITT inaugurated the new division into the U.S. market with the introduction of two computer-related products, the Alphascop CRT display terminal and the Envoy Dataprinter with eight-track punch and tape reader.

The 3100 Alphascop CRT display terminal, developed and previously sold by Standard Radio and Telephone, ITT's Swedish subsidiary, is an alphanumeric display with an optional screen capacity of either 720 or 1360 characters. The display is said to be IBM S/360 compatible, and the device will rent for about \$460/mo. with an associated controller. The controller unit can handle from four to eight CRT units, depending on display capacity.

Developed originally for air traffic control applications, the 1360-character model features 16 text lines of 80 characters each, one format line, and a program line of 80 characters which shows five program keys. The 720-character model has eight text lines. An individual 720-character CRT can be added to a system for \$40/mo., the company says.

The 3010 Envoy Dataprinter, also introduced at the show, was developed by ITT Creed, the firm's British subsidiary.

ITT says the printer is equivalent in price to the Model 35 Teletype, while incorporating the features of the Model 37.

Acoustic Coupler Line Available

COLUMBUS, Ohio — "Design 79", a line of acoustic data couplers featuring acoustic transmission and inductive reception, is being offered by Design Elements Inc.

Available in originate-only, answer-only, and originate-answer models, the "Design 79" line is said to be compatible with all standard telephones and all popular data terminals.

The price for the originate-only and answer-only models is \$345 each. The originate/answer unit is priced at \$435. The "Design 79" line is available on a two-week delivery schedule.

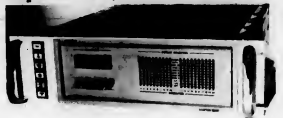
Design Elements Inc. is located at 2074 Arlington Ave.

The unit, which employs DTL multifunction circuit boards, includes an eight-track punch and a tape reader. The hard copy printer provides 72 characters per line with 10 lines to the inch. The punch, reader and printer operate at 10 char/sec. First deliveries are scheduled for mid-year.

Data Multiplexer Designed for In-House, T/S Computers Operates With 5 Channels

BURBANK, Calif. — A low-cost data multiplexer designed to communicate with in-house or time-sharing computers is available from Sagetec Corp. Called the Model 2600, the device can handle up to five digital data channels using either BCD or binary coded inputs, according to the manufacturer.

The Sagetec Model 2600 Data Link generates an ASCII format output compatible with teletypewriters, the Bell System 103A data set, and EIA compatible acoustic couplers. The normal rate of transmission is 110 bit/sec, but the unit can operate up to 10K bit/sec for high-speed terminals and CRT displays.



Model 2600 Data Multiplexer

The device is supplied as a basic unit for one channel with five BCD digits, constants, internal multiplexer and ASCII code conversion, at \$3,300. An expanded unit with five data channels and input registers is priced at \$4,250. Delivery is 60 days.

Digital data word length in the Model 2600 is controlled by a switch settable selection matrix, which can add constants, special symbols, line feed, and carriage return control signals.

Sagetec Corp. is located at 822 N. Hollywood Way.

New housing development.

It's the new National Data Reference Control System, the simplest, most complete record-keeping system ever designed for computer printouts!



Here, for the first time, is a total housing system of date binders and compatible hinging devices and accessories fully integrated with a complete selection of floor and desk-top referral and retention units. No more improvised binding or hanging methods, no more make-shift storage arrangements.

The heart of the new system is National's exclusive Heng-A-Rel™ Binder designed to simplify the binding and hanging of burst and unburst printouts. A unique sliding hook extends to hold the binder in suspension or slides back into the binder.

for easy carrying and reference.

A secondary connector unit called Slide-A-Rel™ is used in tandem with the versatile binder to provide easy hanging and to permit users to slide bound printouts in and out of desk or floor storage stations.

The National Control Rack 900™ Series of attractive, sturdy floor and



desk-top storage units is engineered to provide maximum flexibility in setting up modular control stations to meet every record-keeping requirement. The series includes both skeletal and fully enclosed locking units as well as a sturdy connecting unit called Connect-A-Rel™ which enables users to link various combinations of floor racks.



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Annual AMA Conference Stresses Readiness for 70s

NEW YORK — The 16th Annual EDP Conference of the American Management Association (AMA), entitled "EDP Management in the Decade of Terminal-Oriented Systems," will be held Feb. 23-25 at the Americana Hotel.

Presentations by more than 50 industry leaders have been selected in keeping with three major themes: the manager and his organization; data and its mechanism; and the relationship of managers, data, and organization to the terminal-oriented system.

Getting a Headstart

"Our primary job," commented John Alexander, AMA division manager, management systems and sciences, "is to get

people prepared emotionally for the future."

Toward this end, the three-day conference will combine concurrent afternoon "what's happening" sessions with morning sessions geared to the problems of the new decade. Afternoon sessions will consist of four or five individual presentations, a panel discussion, and a question and answer period.

Varied Topics

Morning topics scheduled for the first day are: Designing Systems Responsive to Organizational Dynamics; Designing the System Into the People Factor; and Getting the Computer Into the Business Mainstream. The luncheon address will be Developing Computer Reporting

Systems for Elections 1972 and Beyond.

Monday afternoon sessions will be conducted on New Approaches to Data Base Design; Risk Analysis and the Computer; The Super Computer: Potentials and Pitfalls; and A Hard Look at Purchasing Packaged Software.

Tuesday morning presentations will include: Organizing the Data and Managing the Data Resource; Large Scale Integration (LSI)—the New Technology and the Computer Community; Exploiting the Capabilities of the Scientific Computer in a Terminal Oriented Business Systems Environment; and EDP

Facilities Management in the Seventies—Promises and Pitfalls. The luncheon address will be Researching the 1980s Today.

Concurrent afternoon sessions on Feb. 24 include: The Minicomputer Invasion; Executive Information Briefing Center; Catastrophe Prevention in the Computer Complex; and Microwave Data Communications.

Morning presentations for the final day of the conference will be: The Computer as a Tool to Solve Macro-Socio-Economic Problems of the Future; Putting the Management Sciences On Line for the User; Interrogating the Computer—1980; and The Computer Community—1980.

General chairman of the conference is John L. Jones, vice-president, Southern Railway

System, Atlanta.

Among those delivering addresses are Maynard L. Rourke, director, systems office, Ford Motor Co.; Harold Uhrbach, director of professional services, Auerbach Corp.; Wallace E. Samuelson, manager, management systems and data processing, Lawrence Radiation Laboratories; T. Paul Bodley, vice president, computer control division, Honeywell, Inc.; and Dr. Alan J. Perlis, head, computer science department, Carnegie Mellon University.

Registration fees are \$100 for AMA members; \$125 for non-members. Additional information and registration forms may be obtained from the AMA at 135 W. 50th Street.

Calendar

Feb. 12-13, Washington, D.C. — A workshop to examine the capabilities of computer aided instruction and evaluate its potential use. Registration fee is \$125; information is available from Mr. Robert Barnes, Interactive Computing, Inc., Dept. CAL, 900 S. Washington St., Falls Church, Va. 22046.

Feb. 16-18, Chicago — AMR International, Inc., presents a three-day seminar on Managing Computer Programming. Also, in New York on March 23-25. For information contact: AMR International, Inc., Advanced Management Research, 280 Park Ave., New York, N.Y. 10017.

Feb. 16-20, Chicago — Seminar entitled "Executive Decisions and the Computer Age," presented by Management Research International, Inc. Also on March 23-27 at Pine Mountain, Ga. Contact: MRI/Seminars, 2329 Hancock, Austin, Texas 78756.

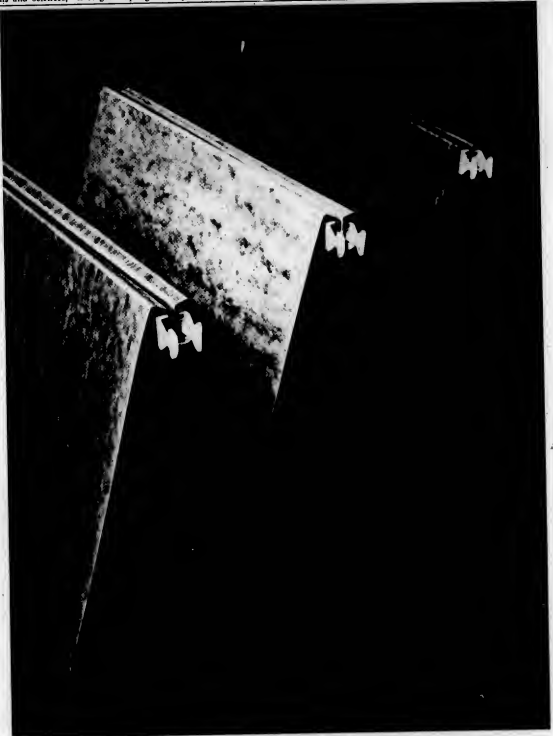
Feb. 17-18, Grand Rapids, Mich. — Herman Miller Research Corp. presents a seminar on "The Human Performer in the Machine and Computer Related Office." Contact Mrs. Nancy Jacobs, Herman Miller, Inc., Zeeland, Mich. 49464.

Feb. 19-20, Los Angeles — "The Development of Management Skills" is the theme for Adapso's 28th Management Conference. Contact: Adapso, 551 Fifth Ave., New York, N.Y. 10017.

Feb. 23, Montreal, Quebec — Association for Computing Machinery presents a development seminar on "Computer Input Systems." Also on Feb. 25 in Chicago, on Feb. 26 in Arlington, Va., and on Feb. 27 in New York City. Contact: ACM Professional Development, 1133 Avenue of the Americas, New York, N.Y. 10036.

Feb. 23-27, New York City — AMA's Senior Systems Course. Contact: AMA Bldg., 135 W. 50th St., New York, N.Y. 10020.

Feb. 25-27, New York City — AMA's briefing session on EDP people will include the recruiting and selecting, the training, and the motivating and retaining of EDP personnel. Contact: AMA Bldg., 135 W. 50th St., New York, N.Y. 10020.



UCLA Students Go 'On-Line' for Course Registration

LOS ANGELES—A computerized registration system at UCLA recently aided scheduling of winter-term classes for about 10,000 of that school's 27,000 students.

The system was designed so that when an operator keyed in the student's identification, his preregistration class selections appeared on the screen. If all the classes the student had selected were available, the schedule was

confirmed.

If a class were full, or not available for some other reason, the student requested an alternate course, and the new program was checked for time, exam, and other conflicts.

Dale Newberg of Computer Communications, Inc., manufacturer of the 30 CCI-30 display terminals used in the project, estimated the average per-student enrollment time at about

one minute.

Multiple Enrollment Curbed

The procedure also provided safeguards against some registration practices, such as enrollment in several classes to allow leisurely selection of the most convenient course at a later time. Enrollment in courses requiring unfulfilled prerequisites or courses in excess of the total permissible class load was also

prevented.

If the plan were graded on a "pass-fail" basis, it would clearly get the go-ahead for future use from its planners. They felt, however, that improvement in some areas was called for.

Major Hangeup

"We did not inform the students properly," explained Luke Villarreal, manager, systems and procedures, for the campus com-

puting network. And when the doors opened at the Ackerman Student Union Building, where the terminals were located, some 6,000 students were waiting in line.

A student committee is presently trying to devise a satisfactory priority system to ease the "people problem" before the next registration period. Student reaction to the project was mixed. Villarreal said, but noted that many students were awed by the capabilities and speed of the system. One coed is said to have beamed, "I just

Education

talked to God the computer!"

The project utilized the services of UCLA's two IBM 360/91 systems; one of them standing ready for backup. "Had our system gone down," Villarreal said, "we could have switched in 26 minutes.... We ran a test, and our computer people did a tremendous job of bringing it up."

UCLA's Joe Scully designed the software for the system in PL/I, a job Villarreal described as "superb."

Several schools expressed interest in the project, he said, and others sent representatives to view its operation.

Given better student scheduling conditions, the school anticipates greater time savings for the spring quarter.

Ultimately, a plan calls for the computer to maximize use of campus space by assigning classes to rooms, based on the nature of the class and the number of students enrolled.

IBM Introduces Three Advanced Systems Courses

WHITE PLAINS, N.Y.—IBM has announced the addition of three courses to its advanced systems science education curriculum for data processing professionals.

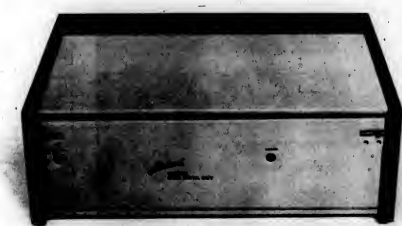
The first, running for four weeks, is Design and Analysis of Data-Based Systems. Intended for experienced systems analysts and data processing managers, it will cover auxiliary storage concepts and equipment, as well as "special techniques" used to design complex systems. Tuition has been set at \$1,850.

A two-week version of the course, for \$920, will be offered for graduates of Design and Analysis of Communications-Based Systems, a course covering the design of computer terminal networks.

The third offering is a one-week class entitled Project Management. This \$460 course is designed for systems professionals responsible for managing the design, development, and installation of major computer projects, and is said to cover estimating, scheduling, and problem-solving techniques.

The newly instituted courses are scheduled to begin in March at the IBM Systems Research Institute in New York City.

Introducing the first 4800 bps data modem that acts like one.



The new Lenkurt 26D delivers what other 4800 bps data modems promise.

With the 26D you'll get higher throughput and have fewer errors in centidwits.

The reason is Lenkurt's unique correlative coding which employs a modified duobinary technique. It compresses the required bandwidth and uses a simpler signal with fewer amplitude levels. So there's a much better signal-to-noise ratio.

The result: Fewer errors. More throughput. Reduced transmission costs.

And the 26D has other features you'll appreciate.

An optional 150-bps secondary channel is available for error control. And automatic error detection to eliminate redundant parity

check bits (another bonus of the correlative method).

There are also built-in facilities to simplify alignment and permit faults to be located in the data terminal, the line, or the data set.

The 26D can be arranged for simplex, half-duplex, or full-duplex operation. It will operate over any C2 conditioned voice channel. And it is fully compatible with EIA standards, CCITT recommendations, and MIL standards.

So if you've been looking for a 4800 bps data modem that really acts like one, take a good look at the new 26D.

It delivers.

Write Lenkurt Electric Co., Inc. Dept. C728, 1105 County Road, San Carlos, California 94070.

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Data Transmission Systems from Lenkurt

February 4, 1979



Farm Show?

The "Outstanding Exhibit" at the 1969 annual meeting of the American Society of Farm Managers and Rural Appraisers was that of Computer Management Consultants, Inc.

CMC, Inc., with headquarters in Skokie, Ill., and offices in Chicago, Northfield, Ill., Champaign, Ill., and Ridgefield, Conn., is a computer research and development firm offering software packages to business, government, and industry.

The CMC exhibit presented the advantages of computerized farming for the modern farmer in terms of more profitable decision making, improved information data systems, and accounting methods.

ITT Enters Data Equipment Market, Expands Worldwide Data Operations

NEW YORK—International Telephone and Telegraph Corp. has entered the U.S. data peripheral equipment market and also reported a substantial expansion of its worldwide data services operation in 1969.

Martin E. Karp, general manager of ITT's worldwide Data Equipment, Systems and Services group, announced the formation of the ITT Data Equipment and Systems division. It will have its headquarters in a new facility at East Rutherford, N.J., about 10 miles west of New York City.

The division is headed by Andreas H. Kruse, vice-president, who formerly held a group staff marketing position with ITT Data Services division.

"The new division will market and service ITT-manufactured

equipment and systems designed particularly for the computer-based communications industries," Karp said. "These products range from peripheral equipment, such as data printers and data visual terminals, to security monitoring systems, front-end processors and concentrators."

Karp noted a 100% plant expansion of worldwide ITT data services operations during 1969. He stated that orders of ITT Data Services division were up 90% during the year.

Regarding ITT's international data operations, Karp observed that new data processing service centers were opened in England, West Germany and Denmark and that ITT's first computer center

in Latin America was established in Rio de Janeiro, Brazil. Orders in England and Germany were up 80% and 65% respectively, he added.

Karp said that, "Establishment of this division broadens ITT capabilities to meet the needs of the worldwide information handling industry. It complements the data processing services provided by ITT in the U.S., Europe, and Latin America."

Some of the ITT products were introduced at the Compo show. These products include the ITT 3010 Dataprinter, the ITT 3100 display unit, the ITT 600 data and message control system, the ITT 400 security monitoring system, and the ITT 245 message scrambler.

Control Data Opens Experimental Plant To Employ the Disadvantaged Part-Time

By a Cw Staff Writer

ST. PAUL, Minn.—A Control Data plant that will hire on a part-time basis will begin operations in the Summit University Area here this month, according to a spokesman for the company.

Designed on an experimental basis to employ people in an area which is classified as disadvantaged, the plant will produce simple subassemblies, the spokesman said. It will not invest heavily on capital equipment.

The facility, which expects to employ about 125 people, is part of a company concept de-

signed to assist the underprivileged in areas such as Summit University. In the past two years the company has opened manufacturing plants in disadvantaged areas in north Minneapolis, Washington, D.C., and eastern Kentucky.

This will be the only Control Data plant managed entirely by part-time employees.

Although this procedure has never been attempted before the company expects that it will be successful because of altered production methods and procedures, the spokesman said. Employees will work on a staggered basis.

The plant will hire welfare mothers who are heads of households and need to supplement their income, and have school-age children.

It will also hire high school students and college students who need to add to family income or are paying their way through school.

The real objective of the program is to provide part-time jobs to individuals who cannot take employment in any other way, the spokesman said.

The only criteria for selection of such part-time employees at the facility is their desire to work and stick with it, he added.

Performance Measurement Seminar

Efficiency-minded third generation computer users are vitally concerned with the problems of measuring and/or predicting the performance of their systems. Yet most have relied on the first generation methods of trial and error or educated guesses to analyze their computer operations. Recently, however, sophisticated new tools such as hardware performance monitors, software monitors, and system simulators have been developed making it possible to: (1) obtain precise measurements of hardware and software performance, (2) analyze system bottlenecks to develop appropriate solutions, (3) accurately predict the effects of changes on total system performance. Computer Learning and Systems is offering a two-day educational seminar to promote understanding of these sophisticated tools of modern computer management. Guest speakers will include:

KENNETH KOLENCE—President, Boole & Babbage, Inc., developer of Systems Measurement Software Products (SMS/360).

DUDLEY WARNER—President, Computer Synetics, Inc., developer of the System Utilization Monitor (SUM), an advanced system measurement product.

WILLIAM C. THOMPSON—President, Software Products Division of Computer Learning & Systems Corporation, developer of CASE, a computer systems simulator, and sponsor of this seminar.

Some of the specific subjects that will be examined at this seminar are:

- State of the Art • Hardware Performance Monitors
- Software Performance Monitors • System Simulators
- Hardware vs. Software Performance monitors • Criteria for selection of performance measurement techniques
- Performance measurement as a management and design tool • Personnel Requirements • Role of performance measurement and simulation in the overall system management problem

The cost of this timely seminar is \$250 which includes lunches and all course materials. The seminar will be given in Los Angeles on February 23rd and 24th and in New York on April 22nd and 23rd. Enrollments for the seminars are limited so please let us have your registration as soon as possible. All enrollments or requests for information will be acknowledged with full seminar and enrollment details.

Mr. Robert Harley
COMPUTER LEARNING & SYSTEMS CORPORATION
6201 Leesburg Pike, Falls Church, Va. 22044 (703) 533-8000

Please enroll the following participants in your "Performance Measurement Seminar": ☐ Los Angeles (Feb. 23-24) ☐ New York (April 22-23)

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Weather Office Orders 360/195

Special to Computerworld
LONDON, England—One of the first orders for the new IBM giant, the System 360/195, has been placed in the UK by the Meteorological Office, which for several years now has been seeking a replacement for an overworked English Electric (ICL) KDF-9 system.

About 18 months ago the British Treasury announced that it had authorized the expenditure of "several million pounds" on replacement equipment for the Meteorological Office, and following this, in July 1969, the Meteorological Office announced that it was considering the installation of a super-computer.

At that time the principal contenders were the CDC 7600, IBM 360/85 and the ICL 1908A. The 360/195 was introduced shortly after this announcement and was chosen by the Meteorological Office only after ICL had dropped the 1908A, thus relieving the Meteorological Office of pressure to "buy British."

The Model 195 ordered will have a one

megabyte main store backed by two 2301 drum memories, two 2314 multiple disk units and six magnetic tape drives.

Delivery is scheduled for October 1971. New mathematical models, developed at the Meteorological Office, Bracknell, Berks, for the new computer are expected to result in extensive improvements in the accuracy and detail of short range weather forecasts.

In particular rainfall estimates over 24 to 36 hour periods should be greatly improved.

The computer is also expected to provide reliable but less detailed weekly forecasts, and will also be used for research in long range forecasting.

The Meteorological Office believes that installation of the new system will enable it to stay in the forefront of weather forecasting evolution. Weather charts may be produced automatically from the computer, rather than manually as at present.

The KDF-9 system will continue to be used by the Meteorological Office during

Orders and Installations

the phasing-in period of the 360/195. Once the new system is fully operational the KDF-9 will be phased out, possibly to work in another government department.

The Meteorological Office, which comes under the auspices of the British Ministry of Defence, forms part of a global network of weather forecasting stations, several of which are believed to be considering "super-computers" for their data handling needs. The British lead could thus prove to be highly significant in the future of world-wide orders for giant computers.

Computers from Burroughs Corp. of Detroit, Mich., have been installed in several businesses. B2500 systems have been installed at Dow Badische Co., Anderson, S.C., and at the county court-

house in Media, Pa., for the County of Delaware.

The Royal National Bank of New York and the Long Island Trust Co. of Garden City, N.Y., have both installed B3500 systems for a variety of banking and business applications.

The Ames Co., Division of Miles Laboratories Inc., is using a PDP-11 laboratory computing system, manufactured by Digital Equipment Corp., to monitor and control basic research experiments.

The municipality of Jersey City, N.J., and the nearby county of Essex are planning to install NCR Century computers for accounting applications. Jersey City will receive a Century 200 and Essex will install a Model 100. The Associated British Maltsters, the largest supplier of beverage malts in the United Kingdom, has also ordered a Century 100 to develop an integrated management system.

International Timesharing Corp., Minneapolis, Minn., has sold a version of its time-sharing software system to Control Data Corp. at a price of \$800,000, which will be applied toward the purchase of part of the CDC 3300 system now on issue to ITC. The time-sharing software will be used by CDC for customers who desire conversational time-sharing capabilities.

Data Computer Systems, Inc., Santa Ana, Calif., has announced that Booth Resources International, Inc., Los Angeles, has received a CP-4 high-speed remote communications terminal. Booth will utilize the CP-4 on-line to their 360/50, in demonstrations for their data center customers interested in remote computer service.

Several needle trade companies have ordered or installed Honeywell computer systems recently. Model 120 systems have been installed by Goodstein Brothers, Inc., Wilkes Brothers Co., and Telemor, Inc., all of New York City. Jaymar-Ruby of Michigan City, Ind., has installed a Model 1200, and Berkshire Apparel Corp. of Malden, Mass., has installed a 1250 for order processing, production control and other applications. Prior Tailors, Ltd. of Leeds, United Kingdom, has ordered a Model 3200, which will be used primarily for cut planning.

Delta Data Systems has announced the sale of its proprietary accounts payable system to Cummins Engine Co., Inc., Columbus, Ind.

Recognition Equipment Inc., Dallas, has placed a \$1.9 million order with Data Products Corp. of Los Angeles, for computer line printers. The order calls for Data Products' 4000 series high-speed printers, which will be used in conjunction with optical character recognition equipment.

Computer Facilities Corp., Los Angeles, has installed three Realtime RI systems at Input Data Corp. in Los Angeles. The RI system enables users to enter information directly into a computer through terminal stations.

An ICL 1901A computer is to be installed by International Computers Ltd., London, England, for Bath and Portland Group of Hartham.

Webster Computer Corp., Danbury, Conn., has announced orders for six of its DOS machine utilization reporting systems from Data Science Corp., St. Louis; Blue Cross & Blue Shield, Tulsa; Coast Federal Savings & Loan, Los Angeles; Worcester County National Bank, Massachusetts; and Stelma Corporation & Amphenol in Connecticut.

the computer industry's first key-to-disc data input system accepts the output from 60 or more key stations simultaneously

Time-shared input cuts data preparation costs 80%.

Now you can cut your computer input costs in half. This new innovation in data preparation techniques gives you two money-saving advantages over conventional keypunch or one-key-board/one-magnetic-tape-per-operator systems: (1) the LC-720 employs a computer time-shared input; (2) it is the only system available that provides data output directly on IBM/360-compatible magnetic disc.

By time-sharing the data from 60 or more keyboard operators simultaneously, significant savings in data station costs of as much as 50% can be achieved. Costs drop to as low as \$4300 per data station for a typical 60 station system. For large data preparation installations, the time-shared input is the only economical way to go.

Data entered into the LC-720 is processed by a small digital computer and stored on an IBM/

360-compatible magnetic disc that provides the advantages of bulk storage and high speed random access of data. The problems associated with punched card handling or the mounting, pooling, merging and unmounting of magnetic tape reels are eliminated. All data is conveniently and economically stored in an IBM 1310 disc pack for direct high speed input to your modern data processing system. Naturally, an IBM/360-compatible magnetic tape is also provided with the system as standard equipment.

The LC-720 KeyDisc System also offers for the first time, data verification requiring one input pass only through the system, in addition to the normal technique of verification requiring two different operators. Record size is infinitely variable by each operator from 1 to 100 characters long and the system stores a large library of 30 or more different format control programs, all available simultaneously to any and all operators.

LC-720 KeyDisc System

Bring your own data for a demonstration

Logic Corporation invites you to see an operating demonstration of the LC-720 KeyDisc System at the company's premises. Bring your own original data and Logic will provide a reel of magnetic tape of the output of your data from the LC-720 for later printout at your own computer facility.

To arrange for a demonstration, contact Lewis Barr,
Director of Marketing (609) 428-4826

LOGIC
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Digicon Adds Singapore Center

HOUSTON — Digicon, Inc. is initiating a major expansion program geared toward moving into full scale operations in southeast Asia.

Plans call for the installation of a computer processing center this spring in Singapore — the firm's second outside the U.S. — the addition of two new 40-man land survey crews, and the shift of the 165 ft seismic exploration vessel, the Pacific Seal, from the California coast to Indonesian waters.

Roland Lara, Digicon vice-president in charge of Far Eastern, Australian, and Latin American operations, and the company expects to have the new processing center operational by April of 1970. The Pacific Seal is on its way now to Singapore, which will be its home port. The

in France and Germany, and sales distribution in England and Italy.

To support its expanded marketing program, Celus is constructing an assembly plant in St. Niklas, Belgium, about 50 miles from Brussels. The 11,000-sq-ft facility will house disk pack assembly, quality assurance, testing and warehousing operations. Plant startup is scheduled for March, 1970.

Other Expansions

No-Comet Computer Co. has opened a new research and development center in Norristown, Pa. The facility will be devoted to specialized research and development efforts for the creation of inexpensive computer systems for the small business market.

Datsacorp Corp., Fort Lauderdale, Fla., has opened a southeastern district sales office at 500 East Highway 436, Regency Square Bldg., Casseberry, Fla. The company has also expanded its Barbados production facility. The existing 1,100-sq-ft work area used for memory core stringing will be increased to about 5,200 sq ft by renovating the existing building. An additional 20,000-sq-ft building is planned at Barbados.

Westat Research, Inc., Bethesda, Md., a census summary tape processing center, has announced a new service for the acquisition and analysis of data. Through its Data Services Division, Westat provides guidance and technical assistance in obtaining data from the Census Bureau, other federal agencies, local government agency records and other sources. The company also designs and conducts sample surveys in response to more specialized data needs. The data obtained from these sources is used for planning and decision making in a wide range of fields such as urban planning, marketing research, transportation planning, housing studies, store location, and many other applications. Westat specializes in statistical services, information systems, and computer software.

Data 100 Corp., Minneapolis, manufacturer of terminal and communication equipment, has opened two new offices. The Los Angeles office is at 11941 Wilshire Blvd. and the Chicago office is at O'Hare Office Center, 2720 Des Plaines Ave., Des Plaines.

Caelus Memories Announces European Expansion
SAN JOSE, Calif. — Caelus Memories, Inc., wholly owned subsidiary of Electronic Memories and Magnetics, Inc., has formed a European disk pack assembly and sales subsidiary, Caelus Memories, S.A. Caelus Memories, S.A. is headquartered in Brussels, Belgium, with sales branches

Expansions

new land crews will be ready to go with their first contract work in February.

The Singapore processing center will be equipped with an SDS 9300, programmed by Digicon for complete geophysical data processing. The facility will handle all processing work from both area marine and land survey crews.

With its present expansion plans, Digicon is making its second major step into international operations. The company put into operation in December of 1969 a new computer processing center in Bari, Italy, on the Adriatic coast. The Italian operation is a joint venture with Osservatorio Geofisico Sperimentale di Trieste, and will serve as the processing center for geophysical data originating in Western Europe, Africa, and the Near and Middle East.

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Acquisitions

Computer Dynamics, Inc., Berkeley, Calif., a data processing software firm, has agreed in principle to acquire Ili-A-Graphics, a company of Santa Clara, Calif., specializing in color lithography.

Computer Response Corp., Washington, D.C., has acquired the Institute of Modern Procedures, a locally based data processing school. Computer Response provides professional computer services which include systems management, consulting, programming, and high speed remote batch time-sharing.

Medical Computer Systems, Inc., Dallas, has agreed in principle to acquire American Medical Computer Centers, Inc., Chicago, a wholly owned subsidiary of American Biomedical Corp. of Dallas, in exchange for 400,000 shares of Medical Computer Systems common stock. Medical Computer Systems provides computer service to hospitals, clinics and medical groups through computer centers and data collection centers in Dallas, Houston, Tulsa, Kansas City, San Francisco, Minneapolis, and Fort Lauderdale. American Medical Computer Centers provides an on-line computer sharing service to hospitals and clinics.

United Data Centers, Inc., a national network of electronic data processing centers, has agreed in principle to pur-

chase the assets and business of Sports Data Corp. of New York, a company that provides golf handicapping and billing services to country clubs.

Computing and Software, Inc., Los Angeles, and Mortgage Associates, Inc., Milwaukee, Wis., have announced that preliminary discussions relating to the possible acquisition of Mortgage Associates by Computing and Software were being held. Computing and Software is involved in the management and operation of computing centers. Mortgage Associates is engaged in computerized servicing of mortgages.

International Systems Associates, Ltd., New York, a data processing firm, has acquired Computech, Inc., New York, also a data processing firm, for an undisclosed sum.

Optimum Systems Inc. of Palo Alto, Calif., and U.S. Time-Sharing, Inc. of Reston, Va., have entered into negotiations to merge the two companies. The purpose of the merger is to create a complete computer utility, nationwide in scope. Optimum Systems, a computer systems firm, designs and installs information systems in addition to offering multi-access computer services. U.S. Time-Sharing offers nationwide remote access computing services.

Contracts

Compres, Inc. of Rockville, Md., has been contracted by the District of Columbia Department of Motor Vehicles to design a computer-controlled driver permit system. The system includes an automatic "stop file" which will contain the names of persons whose permits have been suspended or revoked, and which must be referred to before any official document can be issued. The U.S. Department of Transportation, Federal Highway Administration, will underwrite 50% of the implementation cost as part of a highway grant-in-aid project.

The largest industrial concern in Japan, Mitsubishi Heavy Industries Co., has contracted with Univac for delivery of a large-scale Univac 1108 computer system, valued at about \$2.6 million. The primary task of the computer will be to direct an order entry system.

The Naval Research Laboratory has signed a \$1,185,000 multi-computer contract with Systems Engineering Laboratories, Inc. of Fort Lauderdale. The NRL has ordered three Systems 310A computer systems and three sub-systems which will be used in a data collection and computer processing application.

Precision Instrument Co. of Palo Alto, Calif., has received a contract in excess of \$1 million from Litton Industries for its Model PI 1207 R/W incremental digital tape recorder. Litton plans to incorporate the recorders into its 9202 converter that converts text originated on the IBM magnetic tape selective typewriter cartridges to computer compatible magnetic tape.

The U.S. Air Force awarded a one year contract to SofTech, Inc. of Waltham, Mass., to distribute the Automated Engineering Design (AED) software system

developed by the Computer Applications Group of MIT's Electronic Systems Laboratory. SofTech's role is to provide American industry with information to facilitate the use of Public AED.

The John D. Kettelle Corp. has signed an 18 month, \$325,000 contract to provide the Aerospace Defense Command with systems analysis and programming services in support of the Ballistic Missile Early Warning System.

Infotek, Inc. has been contracted by The Aerospace Research Laboratory of the U.S. Air Force Systems Command to develop a mathematical foundation using Syncoer elements. The Syncoer, an engineering model for the smallest nerve fiber, is part of a program to develop new computing techniques based on bionic principles, including electronic analogs of biological functions.

Reappraisal of 7000 parcels of land in King County, Washington, has been undertaken by The Jacobs Co., a subsidiary of Planning Research Corp. of Los Angeles, under a \$655,500 contract from the King County Assessor's office. It is the first phase of a countrywide reappraisal for property tax equalization purposes and is being financed in part by grant-in-aid from the State of Washington.

Under a \$3,363,301 contract from the Federal Aviation Administration, International Telephone & Telegraph Corp. will develop equipment to control present and future air traffic. The contract specifies the production of 285 transceivers and accessory equipment for automatic emergency backup communication systems at the 11 FAA air route traffic control centers.



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Director Recap

Intercomp, a Cambridge, Mass.-based corporation specializing in the design and manufacture of turnkey computer operating systems and related peripheral equipment, has elected its officers and board of directors. Chairman of the board is John deKoven Alsop, president, treasurer, and director, Covenant Group, Hartford, Conn. Chief executive officer and founder of the company is John J. Donovan, assistant professor of electrical engineering at MIT. Joseph W. Alsop is vice-president of corporate development and Michael L. Mark is vice-president of computer products.

In addition, other directors of the corporation include: Robert Graham, associate professor of electrical engineering at MIT; James R. Nichols, security analyst, Goodwin, Proctor & Hoar; Frederick W. Watris, assistant treasurer, MIT; and Martin L. Simpson, director of technology research, G.A. Saxton & Co. Mr. Donovan, Mr. Alsop, and Mr. Mark are also directors of the company.

Applied Data Research, Inc., computer software and service company, has elected David E. Ferguson to its board of directors.

Ferguson is president of Programatics, Inc., a wholly owned subsidiary of Applied Data Research, Inc. and a vice-president of Applied Data Research.

Compucord Inc., Waltham, Mass., has elected Dr. Francis J. Berlandi to the company's board of directors.

Berlandi is presently project director for Isotopes, Inc., Westwood, N.J.

William W. Wright has been elected a director of Microdata Corp., a Santa Ana, Calif.-based computer manufacturing and consulting firm.

Wright has owned his own management consultant firm in Newport Beach, Calif., since 1965.

John W. Busby has been elected to the post of chairman of the board of Optical Scanning Corp., of Newtown, Pa.

Busby founded the company in 1969 and has served as president since that time.

Two new directors were recently elected to the board of directors of Cullinane Corp., a producer of computer software packages and services.

Herbert Abelow is managing partner of Brukenfeld, Mitchell & Co., investment bankers, located in New York.

David T. Rubin is president of Marc Inc., a financial corporation located in Newton, Mass.

Harold V. Stewart, vice-president, manufacturing & engineering of Century Geophysical Corp., has been elected to the company's board of directors.

James Devlin, president of Data Automation Co., Inc., has been elected to the board of directors of Data Tab Computer Corp.

Position Announcements

Director - School Computer Center

Responsibilities will include management of recently established joint computer center for Boulder and Jefferson County Public School systems. The initial hardware will be Spectra 70 / 45 (85K) with early addition of communications capability and editorial codes.

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Starting salary range is 15,000 to 18,000.

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- S/380-65 (7074) - 2880-2 Selector Channels, 10 2420 VII (PE) Tape Drives and 2501-B2 Card Reader.
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Xerox Names Group VP And Executive Changes

NEW YORK - Dan L. McGurk has been named a group vice-president of Xerox Corp. McGurk, who has served on the Xerox board since Xerox Data Systems (then Scientific Data Systems) was merged with Xerox last May, has been executive vice-president of the Xerox computer arm.

Max Palevsky, who founded XDS in 1961 and who has been

president since its inception, also announced this week that he will continue as chief executive officer of the company and McGurk will now be president and chief operating officer of XDS. Palevsky becomes chairman of the board of XDS, and Arthur Rock, who has been chairman, becomes chairman of the XDS executive committee and honorary chairman of the board.

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Those interested are requested to submit Curriculum Vitae and bibliography to: Dr. Howard H. Green, Dept. of Medicine, Dartmouth Medical School, Hanover, New Hampshire 03757.

Mott Heads UCC Computer Network

DALLAS - Leo J. Mott has been named director of computer information systems for Hooker Chemical Corp.

Mott was formerly executive vice-president of the computer utility network, which comprises large-scale computing centers in cities throughout the U.S.

He joined UCC in 1968 as marketing vice-president for the network, responsible for sales efforts in such areas as banking, engineering, time-sharing, and facilities management.

Before coming to UCC, Mott was associated with GE for eight years, starting as sales engineer in St. Louis. Later he was promoted to branch manager of GE's Memphis office. His last position at GE was Dallas district manager, responsible for all sales and technical support in Texas and Oklahoma.

Mott was also employed by Addressograph-Multigraph for five years.

As president of the computer utility network, Mott will be responsible for UCC's nationwide computer operations in 13 states and satellite centers.

The computer utility network, central to UCC's total services concept, provides computer power to users across the U.S. and Europe via terminals located at the user's location.

Hooker Chemical Promotes Dolan to Corp. Director

GRAND ISLAND, N.Y. William M. Dolan has been pro-

moted to the position of corporate director of management information systems for Hooker Chemical Corp.

In his new post Dolan will be responsible for the commercial systems and data processing

Executive Corner

operations located at the Grand Island complex as well as the management information systems department at Niagara Falls. Additionally, Dolan will be in charge of the Warren (Mich.) regional systems center, which serves the Ulydite Corp., a Hooker subsidiary.

Dolan joined the Hooker organization in 1966 as a corporate manager of systems and programming and has been serving as manager of management information systems since February of this year.

Prior to his association with Hooker he was employed in various positions at the Olin Matheson Chemical Corp. and RCA, both in New York City.

Shuler Appointed V.P. & Gen. Mgr. By Univac

NEW YORK - Cecil M. Shuler has been named vice-president and general manager of the new Univac Communications and Terminals Division.

Shuler directs the new group which develops, manufactures, and markets Univac communications and terminals products for the broad range of computer users. He was formerly regional marketing manager for Univac's New York metropolitan region, including the Bell Systems and Western Union groups.

His previous positions include vice-president of product management for the Univac Data Processing Division (1965-1967), vice-president of marketing for Univac's central sales region (1963-1965), sales manager, southern region (1959-1961), and Nashville, Tenn., branch manager (1956-1959).

Shuler joined the Remington Rand Tabulating Division in 1942 in tabulating maintenance, and was appointed Nashville sales manager for its accounting/tabulating department in 1954.

Other Moves

Richard J. Powers has been named president and chief executive officer of Information Handling Services, Denver, Colo.

Burton Mason Jr. has been promoted to vice-president of Computer Time, Oakland, Calif., and has been elected to the board of directors.

Memorex Corp., Santa Clara, Calif., has appointed William S. McAlmon managing director of European operations. He will be responsible for all European activities located in manufacturing facilities in Liege, Belgium, and sales/service offices in virtually every country in western Europe.

William F. Schmied has been appointed president of the Keary Division, Singer-General Precision, Inc., Little Falls, N.J.

Mohawk Data Sciences

Corp. of Herkimer, N.Y., has appointed Lawrence S. Hebb Jr. southern regional manager with headquarters in Atlanta. Hebb will be responsible for the marketing of MDS data processing peripheral units to original equipment manufacturers in the southeastern U.S.

Jacob F. Ruff has been appointed executive vice-president of Information Systems Development, Inc., Kansas City, Mo. Ruff will be responsible for implementation of a number of ISD client services, including formulation, development, and evaluation of computer-based management systems for commercial applications and state and local governments.

Astrodata, Inc. of Anaheim, Calif., has promoted Fred R. Jahne to the new position of sales manager. He will be responsible for Astrodata's sales and marketing activities as well as its nationwide representative organization.

Ernest C. Corriveau has been named eastern regional sales manager of Vanguard Data Systems, Irvine, Calif. Covering the 13-state northeastern area, Corriveau will be responsible for marketing the company's line of data recording systems and remote terminal peripherals.

Compata, Inc. of Tazman, Calif., has promoted Edward O. Bouswell to the new position of executive vice-president, and Robert L. Hooper has been promoted to vice-president and general manager. Bouswell will continue as general manager of the southern California office in addition to his new responsibilities.

Raymond E. Valle has been named director of marketing for the Plasticon/Perfection Division of Data Technology Corp., San Jose, Calif. In his new post, Valle will be responsible for all marketing, market research, planning, and sales activities for the division.

Carl O. Cutrone has been named director of technical services for Computer Response Corp. of Washington, D.C.

Boor, Allen & Hamilton, Inc. of Chicago has elected John G. Deeney and Harvey L. Poppel as vice-presidents in the New York office of the firm.

William A. Herkert has been appointed branch manager of Sanders Associates, Inc.'s Data Systems Division sales office in San Francisco.

Thomas B. Medley has been elected to the position of vice-president of operations for the Florida Division of CT/South Inc., with headquarters in Atlanta.

Remcom Systems, Inc. of Dallas has named Charles S. Lowe Jr., technical marketing consultant.

John L. McNeley has joined the computer technology group of Scientific Resources Corp., Philadelphia, as manager of systems evaluation.

International Computers Ltd. has appointed John F. Daly general manager for Ireland. Daly heads the company's marketing organization based in Belfast, Dublin, and Cork.

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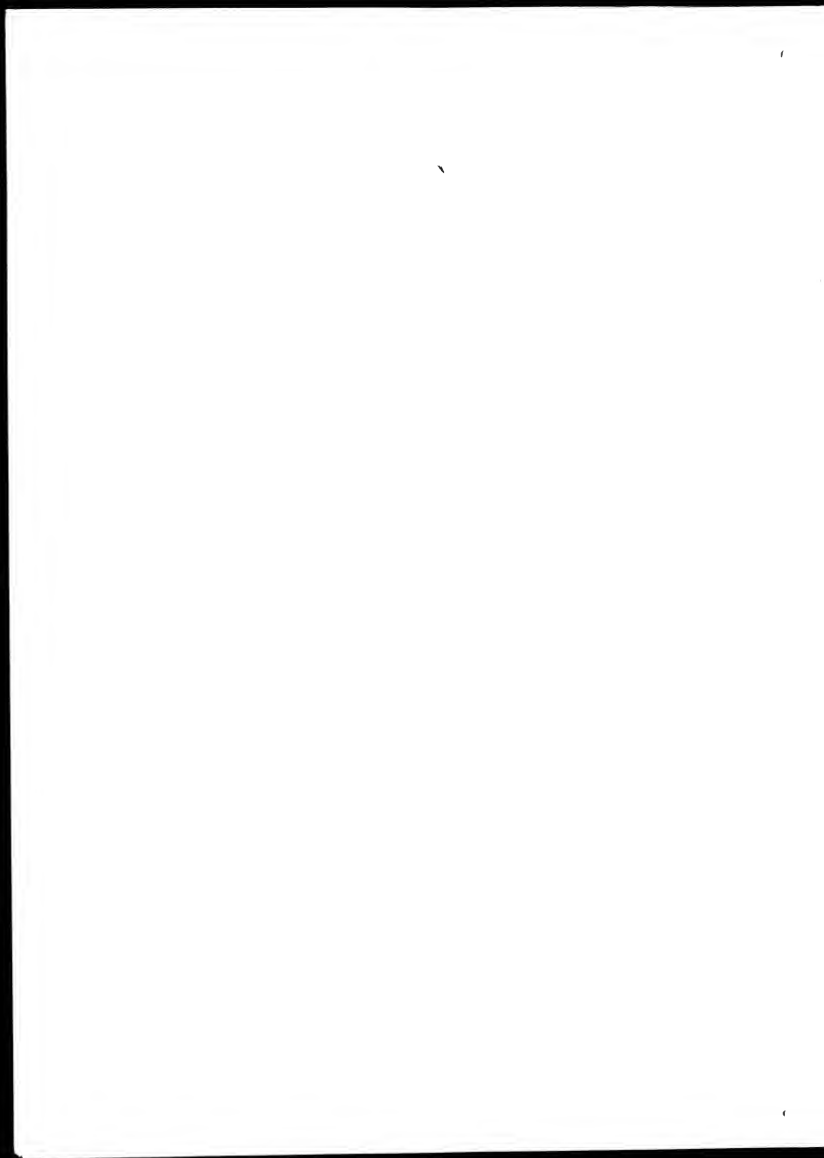
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LOS ANGELES - Computer Management Systems, a new separate operating division of Universal By-Products, Inc. has been formed.

The new division will provide special electronic data processing services for firms in the solid waste management industry and general EDP services for other industries.

The new division is currently designing and implementing a management information system specifically for the solid waste industry.

The first sub-system of this project is a customer information system, which will be operational in the first quarter of 1970, following delivery of an NCR-Century 200 tape/disk computer unit late this year.

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The Latest Gimmick From Texas: New Way to Sell Time-Sharing

By Michael Merritt

CW Staff Writer

DALLAS — Mike Flemming has a plan: First you take the shell of a company that has computer in its name, like Information and Computing Centers Corp. That's good for an extra 10 points on the glamour.

Make it 15. It has "information" in it too. Then you get the company into franchising.

Great! Another 20 points, at least. Remember Minnie Pearl's Chicken Systems? International House of Pancakes? McDonald's? The market loves franchises.

And then... you somehow convince people to give you a million dollars to make the company run — selling franchises to sell computer time.

The idea behind the company is to market computer time and applications through franchises, "bright young salesmen" who will have exclusive sales rights for an area for whatever applications the company or its subsidiaries comes up with.

Flemming and his team believe that they can make time-sharing work by developing firm orders for solidly dedicated computer time before they even turn on a computer.

By the way, ICCO doesn't have any of the applications programs written yet, but it does have fine plans for a building with "floors and floors of computers."

Flemming modestly predicted that ICCO will make only 70 cents per share in 1970; for one thing, they don't have to worry about taxes, since ICCO has plenty of tax loss carry-forward. The 70 cents per share doesn't represent operating income, but the deposits of the new franchisees, who, according to the plan, will pay an aggregate of \$700,000 for the privilege of selling time on a computer that isn't operating yet to run programs that haven't been written yet.

And it's all for real, folks: Flemming is Dr. Michael D. Flemming, formerly of ICCO, and prime mover behind several companies listed on the American Stock Exchange. ICCO stock is sold in all 50 states. He end his friends have put a million dollars into ICCO.

But, then again, it is Texas.

Telex Third Quarter Earnings Higher Than All of Last Year

TULSA, Okla. — Led by a highly profitable computer products division, Telex Corp., manufacturer of electronic equipment, has found its way to third quarter earnings which are higher than company earnings during the entire previous year.

Sales for the quarter just ended were \$16,988,302, an increase of 7% over sales of \$15,699,495 for the same period a year ago. Net income for the quarter showed an even greater advance, increasing by 37.6% from \$434,553 in the third quarter a year ago to \$2,068,658. Fully diluted per-share earnings increased 350% in the quarter, from 22 cents (adjusted) to 99 cents per share.

Telex's performance for the nine-month period just ended also reached new record highs. Nine-month sales totaled \$39,544,262, an increase of 59% over sales of \$24,868,540 for the same period a year ago. Net income for the nine-month period increased from \$1,078,718 to \$3,905,407. Fully diluted earnings per share increased, for the nine-month period, from 56 cents (adjusted) to \$1.89.

S. J. Jatrass, Telex president, said the improvement in the company's position continues to result almost entirely from the

sales and profit performance of the highly profitable Computer Products Division. Nearly half of total corporate sales for the nine-month period were in computer products, and this division produced an even higher portion of corporate earnings.

Jatrass also revealed significant improvements of the company's balance sheet position. A year ago the company's long-term debt was \$3,845,000. This has been entirely eliminated, principally through the call in December of outstanding convertible debentures.

Telex also reduced short term debt in the past year from \$5,650,000 to \$4,191,000.

The company's Midwestern Instrument Division, located in Tulsa, was operating at a loss a year ago. Jatrass has reported that the division is now operating at a good profit level. During the quarter just beginning the division will begin deliveries of a new incremental cassette digital tape recorder to original equipment manufacturers in the computer terminal industry.

The sales level of the company's Communications Group is slightly above last year's level. Earnings are down somewhat, however, primarily because of increased costs and intensified developmental activity.

Dial-Data Will Operate As Division of Tymshare

PALO ALTO, Calif. — Tymshare, Inc. of Palo Alto, Calif., and Dial-Data, Inc. of Newton, Mass., have agreed to approve by shareholders.

"The merger between these privately held companies," according to Tymshare president T. J. O'Rourke, "will result in the third largest time-sharing company in the country, ranking just behind General Electric's and IBM's time-sharing subsidiaries." In the combined organization, Dial-Data president L. C. Clapp will be named executive vice-president and a director of Tymshare, Inc. and O'Rourke will continue as president and chief executive officer.

Dial-Data operates computing centers in Boston, New York, and Washington and has additional sales offices in Hartford, Conn., and St. Petersburg, Fla. It is a major user of XDS 940 time-sharing computers, identical to those in use by Tymshare at its computing centers in

Cupertino and Ingleswood, Calif., and Englewood Cliffs, New Jersey.

The addition of Dial-Data's 60 employees will bring the company's total personnel complement to almost 300.

"Dial-Data equipment, software and people form a strong complement to Tymshare organization," said O'Rourke. "We expect that Dial-Data's expertise in electrical engineering packages will have a significant impact on our West Coast operation."

"Overall, the addition of its strength to ours will make us the nation's largest independent time-sharing company."

The roster of application programs and related services developed by Dial-Data, which is especially strong in the field of financial analysis and electrical engineering, will be added to Tymshare's library of application programs designed largely for scientific and engineering use.

Digital Equipment Up 72% As Sales Grow 62% in 6 Months

By a CW Staff Writer

MAYNARD, Mass. — DEC's June sales at Digital Equipment Corp. have jumped 62% for the first six months of their fiscal year, while earnings rocketed 72% for the major producer of minicomputers.

Company president Kenneth H. Olsen smoothly attributed the new records to "continued increased market acceptance of

the company's products and services across the board."

DEC reported total sales of \$60,876,200 and net earnings after taxes of \$6,288,500 for the period ended Dec. 27.

A company spokesman said that DEC was "very pleased" at market reaction to the new, 16 bit PDP-11 announced a few weeks ago, and that orders were "in the hundreds." DEC will begin shipping a limited number

of the PDP-11s in the late spring. DEC, known primarily as a minicomputer manufacturer, also makes modules, microcomputers, and the large PDP-10. The spokesman said that sales of the 10 were increasing, not only in number, but in size of each installation, as purchasers give the company more of the system responsibility.

He added that the PDP-8 line was doing "beautifully." The PDP-8 is virtually without competition from other 12 bit word minis.

Other Areas Good

Other segments of the company's activities are apparently doing as well. Pilot deliveries of the PDP-15 should begin this month, with full production in the spring, and deliveries of the PDP-12 have reached 140. Module production, of which 70% is used in-house, is also increasing.

In a letter to DEC shareholders, Olsen pointed out that a recent industrial report indicates that DEC is in third place in the computer industry in number of installations. The company has over 7,000 systems in the field. First place is held by IBM, while Univac is second.

DEC has recently added 16,000 ft. to its manufacturing facilities, and \$78,000 sq. ft. more are being constructed.

Bauer Sees IBM Taking 40% of Software Market

SHERMAN OAKS, Calif. —

The head of a major independent software company sees IBM as gaining no more than a 40% share of a projected \$2 billion a year proprietary software market in 1975, considerably less than its penetration of the hardware market — estimated at 70%.

Dr. Walter F. Bauer, president of Informatics Inc., reports that IBM's unbundling decision has already had a beneficial effect on the accelerating market for software products (systems sold to resellers who are expected to custom software developed for a single customer).

During 1970 and 1971, he said, separate pricing will have an

increasingly beneficial effect on all proprietary software, which, while it currently only totals some \$30 million of the estimated \$4 billion software industry (much of which is accounted for by free software supplied with hardware by manufacturers, and in-house software developed by customers), will triple to \$100 million in 1971, reach \$2 billion annually by 1975 and \$5 billion by 1980.

This rapid growth of proprietary software, Bauer said, is the result of three developments: the rapid growth of the computer industry itself; the growing reduction in in-house programming; and the increased dependence and acceptance of software products.

Computer Sciences Corp. President Estimates \$1 per Share Earnings

NEW YORK — Computer Sciences Corp. has estimated that its earnings for the fiscal year ending March 27 will be \$1 per share on revenues of \$105 million.

The estimated results for fiscal 1970 compare with per share earnings of 53 cents and volume of \$65 million in 1969.

Addressing the New York Society of Security Analysts, CSC president William R. Hoover said he expected internally generated growth to raise CSC's fiscal revenues to \$85 million, a 30% increase over 1969, while the pending acquisition of Commonwealth Service Co. should contribute additional revenues of about \$20 million.

The Commonwealth acquisition is scheduled to close later in

CSC's current quarter, according to Hoover.

The CSC president noted that the estimated 1970 results would exceed the company's forecast, made three years ago, of \$100 million in revenues and net income of 10% of revenue for the current fiscal year.

Looking ahead, Hoover predicted further revenue growth to \$600 million by 1975, and continuation of a 10% after-tax return on revenue.

Hoover said the 1975 forecast is based upon CSC's established leadership position in the information technology field, upon increased attention to opportunities in the commercial market, and upon expected returns from the company's information network and other proprietary investments.

Mini Review: Part II

Digital Equipment Corp.: Maxi-Frog in a Mini-Pond

By Michael Merritt

CW Staff Writer
The comparison is made so often, and is so elegant, that it's hard to realize it may not be true. It's almost mathematical — Digital Equipment Corp. is to minicomputers as IBM is to large-scale computers. And in some ways the comparison is true.

Which just makes it all the more misleading.

The Road to the Mini

DEC was first formed in the late 1950s and began its corporate life selling modules and circuit boards. It took some imagination to put a few of their flip-flops together and come out with the PDP (Programmed Data Processor)-1. They did it in 1960.

And it took even more imagination to realize that a small, unknown company was going to sell 59 computers. But sell them they did, because the PDP-1 sold for \$120,000 and offered the computing power of much larger, more expensive machines. Thinking small — as well as thinking cheap — led DEC to the

PDP-5 in 1963, the first real mini, selling for less than \$30,000, and the PDP-5 led to the PDP-8, milestone machine of the minicomputer industry. First announced in April, 1965, the PDP-8 could be bought for less than \$30,000.

And if they needed imagination before, DEC's officers needed delusions of grandeur to predict the success of the PDP-8. So far they have sold over 4,500 of them, enough to make DEC the third largest mainframe manufacturer in the U.S. in numbers of installations.

Along the way from the 1 to the 8, DEC also developed a few other things. Market dominance. A big software advantage. A marketing force. The position of providing a price umbrella for a fledgling industry.

Who's Protecting Whom?

Sounds a lot like IBM, right? Wrong. As DEC proved, you do not need an immense capital investment to start making and selling a mini. IBM isn't holding an umbrella over any 60 competitors for the 360.

A general purpose, large scale computer has pretty stiff competition. Minis don't. The market is so broad, available to exploitation by so many specialized processors, and so large compared to manufacturing capability, that real up against the wall competition, fighting for each bloody sale, just hasn't happened yet.

As evidence of this, DEC's sales have been booming, but its percentage of market penetration has dropped from a cumulative 35% of all installations as of August, 1969 to an estimated 27% of all shipments in 1969 alone.

In a few years the competition in the mini industry will no doubt become fierce, as marginal companies find themselves fighting for survival; but in the meantime DEC isn't holding an umbrella over anybody — they're just selling whatever they can make, and if somebody else sells a few minis, great for them.

What They Do Have

What DEC is doing is pouring as much money into R&D as they take in earnings. DEC's

research budget runs about 10% of total sales. And they're writing programs, the key to the mini market five years from now. They're beginning to standardize their interfaces with the Unibus feature of the new PDP-11. And they're developing a product line.

And they're making money hand over fist. Which you can't say for few of its 60 competitors. Last year DEC showed a 27% return on equity, and this is typical of the company's last decade.

They've also developed a product line. DEC now derives only about 40% of its revenues from minis; they also make a large scale general purpose time-sharing computer, the PDP-10, a range of midsize in configurations

Telstat System To Tip Brokers On Stock Prices

ATLANTA, Ga. — A new computer service to provide stock market traders with daily information on probable short-term price movements for nearly all stocks listed on the New York and American Stock Exchanges will be operational here in early February.

Telstat Inc., which developed the Telstat 100 system, said the service would be available to a limited number of subscribers at \$150 per month. It will not be sold to brokerage houses, the firm said, because their leverage could throw off the projections. Subscribers to the service will be able to enter requests for information on specific stocks, or candidates for purchase or short sales, through Touch Tone telephones from any section of the country, Telstat said. The information will be relayed to the subscriber through audio-response devices, the firm added.

The raw figures on stock exchange trading will be stored in the computer every day along with a trading history file for each stock. Updated target prices for each stock will be computed through the use of statistical analysis and will be available to subscribers by about 9 p.m. every day, the firm said. Included in the basic price is a total of one hour of toll-free calls to the computer. After that calls will be billed by the minute.

The service is open 24 hours a day.

Telstat, Inc., is located at 361 E. Paces Ferry Road, NE Atlanta, Ga.

of the PDP-9 and -15, a process controller with a read-only memory in the PDP-14, as well as modules, peripherals, and the very important software to activate all these machines.

And they have one more advantage. Since minis are so cheap, you have to make and maintain them in volume to turn a profit. Rather than painstakingly handcrafting each like a 360/195, you make them as Detroit makes cars, on an assembly line. DEC now has over 2 million sq ft of automated manufacturing facilities in six plants in the U.S., Canada, Puerto Rico, and the UK. It may take only a garage shop and a few thousand dollars of parts to make a cheap, one-off mini, but it does take time and much capital to develop a facility like this.

So DEC's position in the industry is still in a state of flux, because the industry is still expanding to accommodate the market. DEC may be the largest manufacturer of minis now, but this doesn't guarantee that they will be so five years from now. What they do have is a hand start on their competitors in every significant aspect of the business: manufacturing, marketing, software support, product line, research. It's doubtful they will ever approach a domination of their field analogous to IBM's, but when a shakeout comes to this industry, as it inevitably will, DEC can only profit.

And what of the competitors? The major ones — Honeywell, Hewlett-Packard, Varian among them — have strong corporate backing and financial resources, and others are held up by the proverbial wish and a prayer. More about the challengers to DEC's dominance next time.

New Registrations

PERIPHERAL DATA MACHINES, INC., 1546 E. Chestnut Ave., Santa Ana, Calif. 92701, a company that plans to develop a mass production industrial assembly using artificial technology to produce computer hardware and maintenance manuals and plant instruction for the service organizations that will install and service the company's products; for supplying warehousing, distribution channels, inventory and carrying accounts receivable for general and general corporate purposes. The underwriter is D.H. Blair Securities Corp., 46 Beaver St., New York, N.Y. 10005.

THE TRANSCONTINENTAL DATA PROCESSING CORP., 12011 San Vicente Blvd., Los Angeles, Calif. 90049, a company engaged in the sale of franchises and equipment to service companies and individuals in various areas of data processing, filed to register 50,000 shares of common stock. Proceeds, at \$10 per share maximum, intended for financing equipment, purchased by franchisees, working capital and general corporate purposes. The underwriter is Chartered New England Corp., 90 Broad St., New York, N.Y.

This advertisement is not an offer to sell nor a solicitation of an offer to buy any of these securities. This offering is made only by the Prospectus.

New Issue

January 22, 1970

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Copies of the Prospectus may be obtained from the undersigned only in States where the securities may legally be offered in compliance with the securities laws thereof.

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Nickels and Dimes

In the Mailbox...COMPUTEST first half results show sales almost doubling and net rising from \$198,000 to \$296,000. Figures out to 32 cents a share against 1968's 21 cents. Computest's president attributes the rise to the subsidiary Computer Test Corp., which covered the lackluster results of the Microdyn Technology and Communications Technology divisions... DPA, INC., of Dallas reports sales up 80% and net up 63% for fiscal 1969. Sales were \$27 million and earnings \$2,050,000. DPA owns Information and Technology Systems, Salt Lake City software and time-sharing house... Going public in June, COMPUTER DELETIONS, a software shop. They started out in 1968 in the president's basement, and have computerized the back offices of a couple of Wall Street brokers among other goodies... Suit filed by DIGITRONICS for patent infringement against MARKETING SYSTEMS INC., this one for a recording system for business machines. Digitronics also has another suit going against Marketing Systems for infringing on a signal generator patent... CYBERMATICS, working on the software for WESTERN UNION's computer communications network, has a letter of intent to sell 100,450,000 shares of its stock at \$11.12 per... AMERICAN RESEARCH AND DEVELOPMENT, INC. directors declared a 6 cent per share dividend, payable to stockholders of record on Feb. 6... OMNITEC, 83% owned by NYTRONICS, reported per share loss down to 1 cent per share from last year's 10 cents. Net loss was almost \$300,000. Omnitec makes acoustic couplers, portable data terminals, magnetic tape subsystems, and card readers... SYSTEMS ASSOCIATES revenue up to \$1.6 million from \$1.1 million, but acquisition of Information Systems Design and Water Resources Engineers and related start-up costs turned last year's one cent a share profit into a 68 cent a share loss. Total loss came to a little less than \$700,000... Sales tripled at COMPUTER ENVIRONMENTS CORP. for 1969 and per share earnings doubled to 35 cents. Total revenues for the New Hampshire company were \$3 million and net income was \$150,000 including a \$20,000 extraordinary item... STERLING ELECTRONICS president M.S. Spolone predicts his company's earnings may dip as much as 10%. Military cancellations, high interest rates, and poor pre-Christmas retail sales are the gremlins... GOULD, INC., plans a \$25 million sinking fund debenture offer. SEC registration at the end of January and sale in late February or early March... And the Safe Manufacturers National Assoc. says that it is for specially designed safes for computer records will boost their sales substantially in 1970. Everybody wants to get into the act.

Computerworld Stock Trading Summary

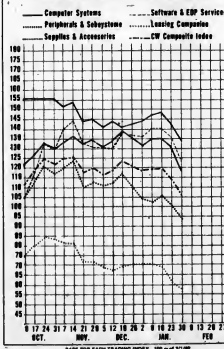
NEW YORK AND AMERICAN STOCK EXCHANGE CLOSING PRICES, FRIDAY, JAN. 30;
OVER THE COUNTER, THURSDAY, JAN. 29

| COMPUTER SYSTEMS | | | PERIPHERALS & SUBSYSTEMS | | |
|-------------------|---------------------------------------|----------|--------------------------|---------------------|----------|
| '69-'70 | CLOSING | WEEK | '69-'70 | CLOSING | WEEK |
| EXCH. | PRICE | CHANGE | EXCH. | PRICE | CHANGE |
| A 36-13 15 | ASTRODATA | + 1/4 | 85-50 50 | ADDRESSOGRAPH-NULT | + 2 1/2 |
| N 172-120 158 1/2 | BURROUGHS CORP. | - 6 7/8 | Q 71-10 14 1/4 | ALPHANUMERIC | + 7/8 |
| N 69-24 25 | COLLINS RADIO | - 1 | Q 32 32 | AMPER | + 5/8 |
| N 127-15 15 | CONTROL DATA CORP. | - 2 3/4 | Q 159-9 | ROLT, BERANEK & NEV | - 1 1/2 |
| A 124-54 112 | DATA EQUIPMENT | + 5 1/2 | Q 17-9 11 5/8 | BUNKER-RAD | - 1 1/2 |
| N 25-11 3/4 | ELECTRONIC ASSOC. | - 1 3/4 | Q 37-18 23 1/4 | CONITRONICS | + 1 1/2 |
| N 28-10 12 | GENERAL ELECTRIC | - 3/4 | Q 18-11 12 1/4 | COMPTON EQUIPMENT | + 1/4 |
| N 45-25 51 3/4 | FOXBORO | - 1 1/4 | Q 37-18 23 1/4 | COMPUTER EQUIPMENT | + 1 1/2 |
| N 114-75 100 1/4 | HEWLETT-PACKARD CO. | + 7 3/8 | Q 48-30 31 1/2 | DATA PRODUCTS CORP. | + 3/4 |
| N 397-57 156 3/4 | INTERNATIONAL BUSINESS MACHINES CORP. | + 5 1/2 | Q 18-11 12 1/4 | DIGITRONICS | + 1 1/4 |
| N 287-291 335 1/4 | IBM | - 20 3/4 | Q 27-12 10 3/4 | DATA PRODUCTS CORP. | + 3/4 |
| N 171-108 156 | IBM | - 20 | Q 22-12 13 | OPTITRONICS | + 1 1/4 |
| N 87-31 30 7/8 | IBM | - 20 | Q 43-32 33 7/8 | ELECTRONIC M & M | - 1 5/8 |
| N 50-27 26 7/8 | RAYTHEON CO. | - 2 7/8 | Q 149-5 6 5/8 | FABRI-TEK | - 7/8 |
| Q 43-13 9 1/2 | SCI. CONTROL CORP. | + 4 7/8 | Q 37-13 14 1/4 | FABRINTON 'HGO | - 1 1/4 |
| N 55-34 34 1/4 | SPERRY RAND | - 2 3/8 | Q 21-10 10 | INFORMATION OIS | - 1 |
| N 55-26 50 1/4 | SYSTEMS ENG. LABS. | + 3/8 | Q 42-13 47 1/4 | MARSHALL INDUSTRIES | - 10 1/2 |
| A 37-72 24 3/8 | VARIAN ASSOCIATES | + 1 3/4 | Q 84-17 72 7/8 | MILCO ELECTRONICS | + 3 3/8 |
| A 61-42 36 7/8 | WANG LABS. | - 6 7/8 | Q 89-75 75 | MONARK DATA SCI. | - 4 |

| SUPPLIES & ACCESSORIES | | | SOFTWARE & EDP SERVICES | | |
|------------------------|--------------------|---------|-------------------------|--------------------|---------|
| '69-'70 | CLOSING | WEEK | '69-'70 | CLOSING | WEEK |
| EXCH. | PRICE | CHANGE | EXCH. | PRICE | CHANGE |
| O 47-31 38 1/2 | ACME VISIBLE | - 1 1/2 | Q 14-4 5 1/2 | ADVANCED COMP TECH | - 1 1/2 |
| N 27-11 11 1/2 | ADAMS-HILLIS CORP. | - 1 | Q 12-10 12 1/2 | APPLIED DATA RES. | - 1 3/4 |
| Q 27-10 10 | BALTIMORE BUS FORH | - 1 | N 19-5 4 | ARIES | - 5/8 |
| N 29-17 18 1/4 | BARRY WRIGHT | + 5 7/8 | Q 147-34 43 1/4 | AUTOMATIC DATA PRC | - 1 3/4 |
| Q 44-26 32 | CALC DOCUMENTS | --- | Q 16-7 13 1/4 | AUTO SCIENCES | - 1/4 |
| N 39-15 18 1/8 | ENNIS BUS. FORH | - 1/2 | Q 17-7 7 1/4 | BRANDON APPL. SVS | - 1 1/2 |
| N 175-62 144 1/2 | TEROLES | - 3/4 | Q 7-7 7 1/2 | COMPUTER APPL. | - 7/8 |
| N 118-94 100 3/8 | 3M COMPANY | - 3/4 | Q 16-6 12 1/2 | COMPUTER ENVIRON | - 1/2 |
| Q 39-59 59 | IBM BUS. FORH | - 1 1/2 | Q 17-11 12 | COMPUTER NETWORK | - 1/2 |
| N 49-36 40 1/2 | NASHUA CORP. | + 3/8 | Q 34-10 28 1/4 | COMPUTER SCIENCES | - 3/8 |
| N 58-50 55 | REYNOLDS & REYNOLD | - 1 1/2 | N 40-6 6 1/4 | COMPUTER USAGE | - 1 1/2 |
| A 31-23 27 1/2 | STANDARD REGISTER | - 3/4 | Q 75-37 37 1/2 | COMPUTING SOFT | - 1 1/2 |
| N 39-25 36 3/4 | JARCO | + 1 5/8 | Q 24-3 4 3/8 | DATAATION SERVICE | - 1 1/8 |
| N 29-10 28 | JANISER MAGNETICS | + 1 1/8 | Q 10-12 16 1/2 | INFORMATICS | - 1 1/4 |
| Q 40-28 32 1/2 | WALLACE BUS FORH | - 1/4 | Q 15-15 15 | ODITER | - 1/8 |

| LEASING COMPANIES | | | SOFTWARE & EDP SERVICES | | |
|-------------------|--------------------|---------|-------------------------|--------------------|---------|
| '69-'70 | CLOSING | WEEK | '69-'70 | CLOSING | WEEK |
| EXCH. | PRICE | CHANGE | EXCH. | PRICE | CHANGE |
| O 14-7 7 3/8 | BANISTER CONTIN | - 1 3/8 | Q 14-4 5 1/2 | ADVANCED COMP TECH | - 1 1/2 |
| O 45-22 22 | BOOTH COOPER | - 1 | Q 12-10 12 1/2 | APPLIED DATA RES. | - 1 3/4 |
| N 18-4 7 1/4 | COMPUTED EXCHANGE | - 3/4 | N 19-5 4 | ARIES | - 5/8 |
| Q 34-10 12 | COMPUTER LEASING | - 2 | Q 147-34 43 1/4 | AUTOMATIC DATA PRC | - 1 3/4 |
| A 60-23 23 1/4 | CYBER-TRONICS | --- | Q 16-7 13 1/4 | AUTO SCIENCES | - 1/4 |
| Q 16-2 7 3/4 | DATA PROF. P & G | - 3 1/2 | Q 17-7 7 1/4 | BRANDON APPL. SVS | - 1 1/2 |
| N 52-49 23 | DATRONIC RENTAL | + 1 1/4 | Q 7-7 7 1/2 | COMPUTER APPL. | - 7/8 |
| A 16-8 8 | DEARBORN COMPUTER | + 1 1/8 | Q 16-6 12 1/2 | COMPUTER ENVIRON | - 1/2 |
| A 45-14 14 3/4 | GRANITE HGT | - 3 7/8 | Q 17-11 12 | COMPUTER NETWORK | - 1/2 |
| N 54-19 19 1/4 | GREENHORN COMPUTER | + 5/8 | Q 34-10 28 1/4 | COMPUTER SCIENCES | - 3/8 |
| N 54-19 19 1/4 | LEASCO DATA PROF. | + 5/8 | N 40-6 6 1/4 | COMPUTER USAGE | - 1 1/2 |
| Q 9-5 5 1/4 | LEASING COV LEAS | - 3/4 | Q 75-37 37 1/2 | COMPUTING SOFT | - 1 1/2 |
| A 57-12 12 3/8 | LEVINTOWN-SONS CHP | - 7/8 | Q 24-3 4 3/8 | DATAATION SERVICE | - 1 1/8 |
| Q 8-1 3 | LHC DATA, INC. | --- | Q 10-12 16 1/2 | INFORMATICS | - 1 1/4 |
| N 1-2 3 | MANAGEMENT ASSIST | - 1/4 | Q 15-15 15 | ODITER | - 1/8 |
| Q 12-6 6 3/4 | NCC LEASING | - 1/2 | Q 14-4 5 1/2 | ELECT. COMP PROG. | - 5/8 |
| Q 31-3 1/2 | SYSTEM CAPITAL | - 1 1/2 | Q 10-12 16 1/2 | INFORMATICS | - 1 1/4 |
| A 22-13 13 3/8 | U.S. LEASING | - 3 1/2 | Q 15-15 15 | ODITER | - 1/8 |

Computer Stocks Trading Index



This information is neither an offer to sell nor a solicitation of an offer to buy any of these securities. This offering is made only by the Prospectus.

NEW ISSUE

January 30, 1970

550,000 SHARES

COMPUTER MICROTECHNOLOGY, INC.

Common Stock

(\$ Par Value \$5.00)

Paid \$7.00 Per Share


Copies of the Prospectus may be obtained from the undersigned only in the States in which such undersigned is qualified to act as a dealer in securities or in which the Prospectus may legally be distributed.

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